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### THE PREOPERATIVE PREPARATION OF PATIENTS WITH JAUNDICE DUE TO GALL BLADDER DISEASE.<sup>1</sup>

By W. J. STEWART MCKAY, M.B., M.Ch., B.Sc. (Sydney),  
Senior Surgeon, Lewisham Hospital.

TONIGHT I want to discuss the various measures that should be adopted in the preparation of patients suffering from gall bladder and duct disease when they exhibit well marked jaundice. It is a common belief that once a gall stone lodges in the common duct, the patient becomes jaundiced. This is not the case; 30% of patients operated on for stone in the common duct exhibit no jaundice; but when they do have well marked jaundice, and they are old and poorly nourished, then we know

that the jaundice is a warning that we have more to attend to than the mere extraction of a stone from the duct. It is because of the intercurrent hepatic and nephritic conditions that we must carry out a deliberate preoperative preparation.

Thirty years ago the preparation of patients for operation was carried out in a very superficial and imperfect way and I like to think that I was the first surgeon to write a work which was entirely devoted to the preparation of section cases and to the after treatment. I saw that the time had come when more attention had to be given to the preparation which in many cases merely meant testing the urine for albumin and sugar, listening for a murmur and the preparation of the skin. We have made great strides since those days and our elaborate preparations now have been the outcome of the great advances made in biochemistry; while our decreased mortality is largely the outcome of prophylaxis.

<sup>1</sup> Read at a meeting of the New South Wales Branch of the British Medical Association on September 25, 1930.

laxis. I do not think that, face to face with, say, a general septic peritonitis which has arisen as the result of our operative treatment, we have advanced one inch in successful treatment since the days of Sir Spencer Wells; our victories in the abdomen are chiefly due to preventive measures, not to mere operative dexterity. William Mayo who has had a larger experience in gall bladder surgery than any other surgeon that has ever lived, for 20,000 patients have been operated on at his clinic, is most emphatic that the preoperative management of jaundiced patients has greatly reduced the operative mortality.

Now in order that we may understand the pathological conditions that we have to deal with in the preparation of these patients, I must ask you to let me put the cart before the horse and tell you how these people die after the operation, in spite of all our care; and what the autopsy reveals, so that we may understand how to proceed.

First of all what do statistics show as regards the mortality after operation on the gall bladder ducts? In the hands of some expert surgeons the mortality rate has been reduced to the neighbourhood of 3%; but notwithstanding the constant improvement in preoperative preparation that has taken place in recent years, there is still a high percentage, for I find that in a series of 6,743 gall tract operations from eleven good clinics in America and England there is an average mortality rate of 8.48%. At the Mayo Clinic, however, the figures are much lower than those, for William Mayo tells us that in 1921 the mortality rate for operations on the common and hepatic ducts was 5.6%, while in 1922, by reason of better preoperative preparation of patients the mortality dropped to 3.8% for operations on the common and hepatic ducts and to 1.6% for 942 cholecystectomies.

I shall now describe the death after an operation on an elderly woman with jaundice who has had a stone removed from her common duct.

The operation has passed off well. We may have had difficulty in extracting the stone from the duct and there may have been a little more manipulation than desired, but apparently the traumatism to her sympathetic, which runs up on the hepatic artery to the liver, did not produce any marked shock and so all goes well for five or six days. The bile drainage is satisfactory and the urine is good, while the temperature and pulse chart are almost normal. Then about the sixth day we find that the bile begins to change. We may not have taken the trouble to observe this, but if we had, we would have found that the bile has become pale and thin, yet it has increased in quantity and this gives us a false confidence. In a day or two the bile diminishes, but yet remains. Then all at once the whole aspect of the patient changes and the woman that we thought was going to pull through without turning a hair, is going to die. She is poisoned and we are convinced of that when we find that she will not eat, grows weaker, has no volume in her pulse and, what makes us still more sure, the temperature falls

below normal. The end soon comes; she begins to vomit, the tongue becomes dry, she can take no nourishment and about the ninth or tenth day she expires.

We were all familiar with this sort of tragedy in the past and wondered if it was our lack of skill that had caused her death; we did not fully comprehend that the effects of the retained bile pigment on the obstructed hepatic cell had been most harmful and destructive and that the cholaemia brought about a pernicious dehydration which interfered with the action of the liver, especially in its one great function, its sugar forming function. To this must be added the bad effects of the bile pigments on the calcium of the blood and their effect on the kidney, called upon to excrete a great amount of bile pigment and other products of disturbed metabolism which brings about kidney incompetency as well as hepatic insufficiency.

Autopsies of fatal cases reveal varying degrees of cirrhosis of the liver and chronic nephritis which so often go hand in hand, but at the same time a patient may die from hepatic insufficiency with infection of the bile ducts and yet show no signs of renal insufficiency, and in these cases, as pointed out by Walters, the urinary output remains proportional to the fluid intake throughout and the urine reveals little or no evidence of marked nephritis and the blood urea remains persistently low. Jaundice means inflammation or infection as a rule.

We may then sum up the cause of death after operation as haemorrhage, renal insufficiency and infection of bile ducts; and these conditions are directly related to the existing chronic obstruction jaundice, hepatitis, biliary cirrhosis, dehydration and chronic under-nourishment (William Mayo).

And now after this rather long-winded introduction, let us suppose that the patient we have to prepare is, say, aged fifty-five years, deeply jaundiced, with some cirrhosis of the liver and chronic nephritis, perhaps with a large quantity of sugar in her urine—such a patient I was called upon to prepare some months ago.

In preparing these patients I always treat them as though they were suffering from an enlarged prostate, though they may be women. We cannot cure the cirrhosis, nor yet the nephritis, and yet we can with patience lessen some of the evils of the effect of the retained bile pigments on the obstructed hepatic cells and we can reduce the pernicious effects of the cholaemia on the kidney. In short, we can reduce the toxæmias and we can increase the calcium in the blood and we can cause glucose, introduced in various ways, to help the lame liver; and now I can defy the blood to ooze after the operation since I have come into possession of a new drug.

The first subject that must engage our attention is the diet. The patient has a damaged liver and perhaps a not too good pancreas and she needs a diet low in fat, while her kidneys need a low protein diet. Her damaged liver needs carbohydrates and

glucose, for these prevent disintegration of proteins, while the patient is in a state of toxæmia as the ash of carbohydrate oxidation is much less poisonous than the ash of protein and fat combustion.

The outstanding fact about these cases is that many of them are dehydrated and it is the cholæmia that brings about the pernicious dehydration; consequently we must introduce water into their system. Now old people, especially men who drink beer or spirits, have a great objection to drinking water, because, as one old fellow remarked to me: "Drinking water is as bad as talking to yourself!" It is therefore impossible to get them to take enough by mouth and if they do it upsets their already poor digestion. Water, which is so necessary to flush the kidneys, may be introduced subcutaneously, which method can be reserved for an emergency, or it may be given by the bowel or lastly by the duodenal tube. The bowel has been much used in the past, but I am sure that the duodenal tube will be the most efficient way of introducing large quantities in the future. We have used this with success at Lewisham for some time, but I had better quote from the observations of those who have had a big experience of this method.

In America McCarthy, Killian and Stepita tell us that:

Ringer's solution, a physiological salt solution warmed to 38° C., has been introduced through the tube to increase the fluid intake. When intestinal evacuation is desired, sodium sulphate is added to this solution. The administration of fluids through the duodenal tube has proved a more efficient therapeutic procedure to increase the volume output of urine than intravenous infusions, hypodermoclyses, or proctoclyses. Moreover, large volumes of fluid (12 litres) can be given without discomfort to the patient and in some instances without interrupting the patient's sleep. The evacuation of large volume of fluid by the rectum follows the lavage. It has been found that in these liquid fæces a greater amount of non-protein nitrogen is eliminable than in the solid fæces. This elimination of nitrogen helps to diminish the nitrogen retention in the blood, probably because the nitrogen waste products, for example, urea, excreted by the small intestine are not reabsorbed in the large intestine, as they would be in the absence of the lavage.

I make it a point to impress on the nurse that water is the most vital constituent of the dietary, pointing out that the chemical changes in the body all take place in a watery solution and the cells are highly susceptible to a concentration of this fluid. Dehydration then in our patient involves diminished blood volume, a concentrated blood and a tendency towards concentrated tissue juices. If there is not enough water available, the urea cannot be excreted through the kidney in proper amounts.

After water, milk is the most valuable food in these cases and peptonized milk can be introduced by dropping the duodenal tube to the jejunum. The milk is warmed to 38° C. and is introduced at the rate of sixty drops a minute. The nutritive value of the milk may be reinforced by the addition of glucose. The American observers favour milk for feeding because they point out that its proteins contain amino acids essential for the body's nutrition.

Besides these foods, we must try to get the patient to take as much carbohydrate as possible, for it is a body protein sparer. Increasing the carbohydrate intake adds to the liver's store of glycogen and thus improves liver function. Moreover, carbohydrate is an antiketonic compound and inhibits the production of acidosis due to ketogenesis.

Now there is another reason why we should give milk in these cases. The blood calcium is exhausted by combination with bile pigments and acids, and this exhaustion of calcium may take place as early as three weeks. It is necessary to supply the patient with calcium and the easiest way to do that is by giving milk. According to Sherman, the average calcium requirement of the adult is 0.45 gramme per day. Since milk contains about 0.20% of the calcium, the total calcium requirement is supplied by 250 cubic centimetres of milk, always provided conditions in the small intestine are maintained most favourable to the absorption of the calcium.

Now it always appears to me that the very people who want calcium most in their systems, are those who are unable to assimilate it. There can be little doubt that the patients we are dealing with want calcium badly; if we cannot supply it by food, can we supply it by administering it by mouth?

Some years ago when Harrower was paying a visit to Sydney, he gave me a very useful hint about calcium. He told me that he had satisfied himself that it was the adrenal bodies that presided over the taking up of calcium. He advised me when treating a patient with urticaria to give calcium lactate by mouth and to inject five minims of adrenalin at the same time. I have often done this and it acts like magic on this rash. If, therefore, we want the patient to take up calcium chloride or calcium lactate, we should give adrenalin once or twice a day. I have not found the taking of adrenalin by mouth a success; it must be injected.

If it is found that the coagulating time of our patient's blood is ten or twelve minutes, we may give her intravenous injections with benefit. No one doubts this; but we are not agreed on the amount that should be injected.

Some years ago, having read the experiments carried out by Lee and Vincent, I determined to try calcium injections and I gave some patients five cubic centimetres of a 10% solution of calcium chloride on three successive days as advised by Walters. I did not notice any disagreeable effects, but when one day I began to give an injection to a lad he soon cried out: "Oh! I am burning all over!" and he continued agitated for over a minute. It was a very long minute for me, for I had visions of his dying, but he recovered and I dropped the calcium injections.

It was not until some time after that I discovered what had happened, not in fact until Lloyd published his experiments in 1928, and pointed out the danger of strong intravenous calcium injections. Lloyd in his paper tells us that he was giving an injection of four cubic centimetres of a 10% calcium chloride solution; when two cubic centimetres of the solution had been injected the subject experienced a sensation of warmth over the entire body,

accompanied by slight headache and a feeling of fullness in the head. It was decided to continue the injections. Dizziness occurred during the period of injection of the second two cubic centimetres and this was closely followed in the course of the next three seconds by syncope, respiratory failure, upward deviation of the eyes, dilatation of the pupils, rigor of the masseters and asphyxial extensor spasm and rigidity. Artificial respiration was instituted and the patient recovered. Lloyd, as the result of his observations, recommends that only a 1% solution of calcium chloride be employed and that fifty cubic centimetres be given. Calcium injections are part of the routine preoperative preparation of patients in America. In some instances, if the patient is very run down, the blood condition can be improved very much by a transfusion of blood, which will supply the requisite amount of calcium.

I now come to the question of oozing after the operation and this is so important that we must in our preoperative preparation try to get the blood into such a condition that the clotting time will be reduced to near normal. The introduction of calcium not only helps to diminish the toxicity of the patient, but helps the blood to clot; but if we do not use the calcium except in the food, we must use something else, and that something else is so sure that I now do not bother much about the calcium. The substance that I use is "Coagulen-Ciba." I have used it for two years almost every week, in all sorts of cases and it never fails. The substance is a physiological haemostatic derived from normal bovine blood platelets and contains the natural coagulating elements necessary for clotting. It is held by some investigators to be a cytozyme in a condition of complete purity. It is sold in glass ampoules of twenty cubic centimetres and it acts more quickly if it is warmed before being injected under the skin. If I am preparing a patient with such a condition as fibroid of the uterus, when the woman continues to bleed, all that is necessary is to inject the patient for three days running with the contents of one of the twenty cubic centimetre ampoules and the haemorrhage will cease. When we expect haemorrhage at the operation and oozing afterwards, the patient is injected in the same way. At the operation the blood often clots so quickly that it forms long pieces of clot which cling to the forceps, as I pointed out recently to a surgeon while I operated on an exophthalmic goitre patient whose pulse rate had been over 200.

When I first began to try this substance, I did two gall bladder operations in one day; one patient had no jaundice, the other had. The one with jaundice was injected for two days before the operation, and I performed the operation on her and had not to tie a single vessel; the other bled in the usual way during the operation. Here, then, we have a very remarkable substance and one that is invaluable in these jaundiced patients; because Walters, working at the Mayo Clinic, reviewed the *post mortem* records for a five year period of pa-

tients who died following operation on the biliary tract, and demonstrated that in 58% of these patients with jaundice who died within the first week after operation, there was more or less blood in the abdominal cavity, usually the result of oozing from the liver or adhesions. This is one of the reasons why cholecystectomy in jaundiced patients is a more fatal operation than cholecystotomy; the raw liver surface is liable to bleed and, although actually the loss of blood may not be the cause of death, it may be a contributing factor.

I might observe here that if I find it not possible to close the tissues over the raw surface in the liver, I stuff in bismuth gauze and this may be soaked in "Coagulen-Ciba."

Lastly, we come to the preparation of those jaundiced patients who have much sugar in their urine. Many times I have observed that the sugar disappears as soon as the stones are removed and the gall bladder drained.

In one case I thought I had to deal with a gall bladder, for the patient had some jaundice and had been treated for three years for diabetes. When I opened her there was a hydatid close to the gall bladder and when this was drained the sugar disappeared from the urine.

But there are cases of real diabetes along with gall stones and then the patients are among the most difficult to deal with. The strict diet and the careful use of "Insulin" and the testing of the blood for sugar have, however, robbed these cases of much of their former danger.

I have mentioned above that in these cases of marked jaundice there is very often a condition of chronic nephritis, and I think that before we decide to operate we should inject them to try one of the blue dye excretion tests. At Lewisham we do not consider a kidney patient is fit for operation unless the blue is a good blue in twenty minutes. It is not the time when the colour first appears, it is the intensity of the colour which must be satisfactory in from twenty to thirty minutes, whether injected into the veins or into the muscles of the back. In prostatic conditions the test gives a warning of renal insufficiency before even urea retention can be demonstrated in the blood. At Lewisham our operative mortality for prostatectomy is about 3%.

In this paper I have not dealt with the various tests that have been tried in America, such as the Van den Bergh test, the Fouchet test and other tests. I fully admit, as Ravdin says, that: "In estimating the functional value of an organ it is usually possible to measure the efficiency of the organ by one or more tests and to get some idea of its functional capacity." This no doubt is the case, but I think it will be best to wait until further experience tells us what the real value of these various tests is to the surgeon.

Lastly, I should like to urge that part of the proper preparation of a jaundiced patient is to ask the anaesthetist to visit him before the day of operation. I am afraid that it has become a too prevalent custom to ring up a friend and ask him if he

will give an anæsthetic for you on a certain day. The day comes, the anæsthetist arrives and proceeds to give ether by the open method, whether that anæsthetic is the most suitable or not.

Now this is not fair to the patient, to the anæsthetist nor yet to the man who has the responsibility of the patient's life in his hands. I maintain that the anæsthetist should visit the patient and form his own opinion as to which anæsthetic will be the most desirable one. At Lewisham one of the senior physicians gives many of the difficult anæsthetics and he makes it his business to see the patient on more than one occasion; then he decides whether he will give ether by the open or by the intratracheal method, or oxygen and gas, or ethylene or other anæsthetics. I am quite sure that these precautions have had a decided effect in reducing the mortality of some of our serious operations.

#### Post Scriptum.

I should like to mention that Dr. Harry Harris always uses the indigo-carmin test by the intravenous method, using eight cubic centimetres of 8% indigo-carmin. He insists that a blue coloration should appear within five minutes, increasing in intensity to a deep blue in ten minutes. Neither a greenish blue nor a pale translucent blue is regarded as satisfactory. I, however, still employ the old method, which I have found satisfactory; and a slight proof is that I have not lost a prostate case during the last seven years. I need hardly say that Dr. Harry Harris operates on many more of these patients than I do and that our method of operation is very different.

#### RECENT ADVANCES IN DIAGNOSIS AND TREATMENT.<sup>1</sup>

By G. C. WILLCOCKS, D.S.O., M.C., M.B., Ch.M. (Sydney),  
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THE subject I have to deal with is "Recent Advances in Diagnosis and Treatment." As special lectures are to be delivered on a variety of subjects later in this course, my field is considerably narrowed. I will shortly consider a few subjects that have attracted attention in the last few years.

#### Renal Efficiency and the "Water Test."

First, there is the test for renal efficiency, which can be carried out by anybody without special apparatus. We are often puzzled to determine the significance of albuminuria or the degree of renal impairment in nephritis, pyelonephritis, prostatic disease, pyelitis *et cetera*. So that any simple test which may throw light on such a subject is worth investigation.

The "water test" has been used for many years in Europe and America, but has not gained any great hold in Australia, I think. The test, when combined with other usual simple examinations, may be very helpful in diagnosis and prognosis, both for the physician and the surgeon. I give you here the results of a small number of tests in a variety of conditions (Table I).

The "water test" is as follows: The patient is instructed to take little fluid after lunch and none

after 9 p.m. on the day preceding the test. At 9 p.m. the bladder is emptied and the urine discarded. All urine passed from 9 p.m. to 9 a.m. is saved and measured and the specific gravity taken (this is the night urine). At 9 a.m. 900 cubic centimetres (thirty ounces) of water or weak tea are drunk and the bladder emptied at 10, 11, 12 and 1 o'clock. The amount of urine passed is measured each time and the specific gravity of each specimen taken.

A normal person passes not more than 600 cubic centimetres (twenty ounces) at night, of a specific gravity about 1025; in the morning output 900 cubic centimetres (thirty ounces) are excreted in four and a half to five hours, at least 450 cubic centimetres (fifteen ounces) in the first two hours, and the maximum should be in the second hour (300 to 450 cubic centimetres or ten to fifteen ounces). The earliest evidence of renal impairment is in poor concentration of night urine, that is, the specific gravity falls towards 1010. Defective renal function is indicated usually by an increase in night urine amount (up to 1.8 litres or three pints in later stages) and by a constancy of specific gravity, about 1010, in the day output, and with diminution in the amount passed in the hourly specimens. A wide range in specific gravity is a good sign.

I do not think this test is of any great advantage in acute nephritis. It is not necessary for diagnosis and prognosis depends on too many factors; but if albuminuria persists, this test may be a useful guide to prognosis. In albuminuria it is useful to distinguish a functional condition from chronic nephritis; in questions of operation on the kidney or prostate and in conditions of chronic pyelitis and pyelonephritis it gives some indication of the amount of sound kidney tissue remaining. In chronic nephritis it may indicate the severity of the lesion. The most important sign of serious renal impairment appears to be a constancy of specific gravity in day and night specimens.

#### Lipoid Nephrosis.

I have alluded above to lipoid nephrosis. That diagnosis is being more frequently made now, though the condition is not accepted universally as an entity. Lipoid nephrosis is parenchymatous nephritis, that is, pallor, oedema and heavy albuminuria, with increased blood cholesterol and perhaps fatty casts in the urine.

In regard to treatment, restriction of fats has been suggested, as by the use of skimmed milk. In this, as in other conditions of nephritis when there is a highly acid urine, I believe the administration of an alkali such as citrate of potash relieves the symptoms and perhaps aids recovery.

#### The Use of Alkalis.

The use of alkalis in infections and in nephritis has a logical basis, for it has been shown that an acidosis may occur in many infectious diseases, in pneumonia, rheumatic fever, typhoid fever and others, also in both acute and chronic nephritis, after anæsthesia, in pregnancy, in chronic and wast-

<sup>1</sup> A post-graduate lecture delivered at Sydney on May 26, 1930.

TABLE I.—SHOWING RESULTS OF THE "WATER TEST."

Condition.	Night Urine.		Hourly Output.	Specific Gravity.	Remarks.
	Amount.	Specific Gravity.			
Normal .. .. .	600 c.cm. (20 fl. oz.)	1025	First hour: 150 c.cm. (5 fl. oz.) Second hour: 300-450 c.cm. (10-15 fl. oz.) Third hour: 240 c.cm. (8 fl. oz.) Fourth hour: 150 c.cm. (5 fl. oz.)	1014 1003 1002 1006	
Hypernephroma .. .. .	480 c.cm. (16 fl. oz.)	1015	First hour: 240 c.cm. (8 fl. oz.) Second hour: 420 c.cm. (14 fl. oz.) Third hour: 360 c.cm. (12 fl. oz.) Fourth hour: 240 c.cm. (8 fl. oz.)	1010 1002 1001 1002	Operated: fully half the kidney normal, dye tests good
Prostatic hypertrophy .. .. .		1015	540 c.cm. (18 fl. oz.) in four hours	1015 1008 1002 1004	Urea 20, urea concentration 1.5, creatinine 2.8, operation, good recovery.
Malignant prostate .. .. .			180 c.cm. (6 fl. oz.) in four hours	1012 1012 1012 1013	Blood urea 45, creatinine 3, urea concentration 1.1, uræmia, died.
Prostatic hypertrophy .. .. .			225 c.cm. (7½ fl. oz.)	1014 1003 1010 1014	Urea concentration 2.9, blood urea 24, creatinine 2, operated, good recovery.
Calculus pyelitis .. .. .	780 c.cm. (26 fl. oz.)	1014	First hour: 75 c.cm. (2½ fl. oz.) Second hour: 285 c.cm. (9½ fl. oz.) Third hour: 60 c.cm. (2 fl. oz.) Fourth hour: 15 c.cm. (½ fl. oz.)	1010 1000 1013 1017	Seems well.
Functional albuminuria .. .. .	450 c.cm. (15 fl. oz.)	1022	First hour: 120 c.cm. (4 fl. oz.) Second hour: 90 c.cm. (3 fl. oz.) Third hour: 150 c.cm. (5 fl. oz.) Fourth hour: 120 c.cm. (4 fl. oz.)	1008 1004 1014 1020	No casts, blood pressure 145-80 mm., age 22, quite healthy.
Functional albuminuria .. .. .	150 c.cm. (5 fl. oz.)	1022	First hour: 105 c.cm. (3½ fl. oz.) Second hour: 210 c.cm. (7 fl. oz.) Third hour: 120 c.cm. (4 fl. oz.) Fourth hour: 90 c.cm. (3 fl. oz.)	1015	Blood pressure 140-85 mm., no casts.
Renal asthma .. .. .	1,500 c.cm. (50 fl. oz.)	1010	First hour: 15 c.cm. (½ fl. oz.) Second hour: 45 c.cm. (1½ fl. oz.) Third hour: 15 c.cm. (½ fl. oz.) Fourth hour: 30 c.cm. (1 fl. oz.)	1018	Blood pressure 190-130 mm., heavy albumin.
Chronic interstitial nephritis .. .. .	1,200 c.cm. (40 fl. oz.)	1008	First hour: 150 c.cm. (5 fl. oz.) Second hour: 90 c.cm. (3 fl. oz.) Third hour: 150 c.cm. (5 fl. oz.) Fourth hour: 75 c.cm. (2½ fl. oz.)	1010 1003 1002 1008	Heavy albumin, blood pressure 195-120 mm., granular casts, tortuous arteries.
Acute nephritis .. .. .	600 c.cm. (20 fl. oz.)	1010	First hour: 120 c.cm. (4 fl. oz.) Second hour: 90 c.cm. (3 fl. oz.) Third hour: 60 c.cm. (2 fl. oz.) Fourth hour: 60 c.cm. (2 fl. oz.)	1010 1007 1010 1010	Urea concentration 1.1, blood urea 19, blood creatinine 1.5.
Chronic interstitial nephritis .. .. .		1011	450 c.cm. (15 fl. oz.)	1010 1010 1010	Blood urea 33, blood creatinine 4.5, uræmia, died.
Subacute parenchymatous nephritis. Lipoid nephrosis.	480 c.cm. (16 fl. oz.)	1012	210 c.cm. (7 fl. oz.)	1016 1011 1015	Cholesterol 1,200 mgm. per 100 c.cm., urea concentration 1.3, blood urea nitrogen 34, creatinine 3.

ing diseases such as pernicious anaemia, and cirrhosis of the liver, as well as in the well known cyclic vomiting of childhood.

A smell of acetone is very common in sick children, apart from cyclic vomiting. Traumatic shock and severe burns often establish a condition of acidosis and it may be found that quite small doses of bicarbonate of soda or of sodium or potassium citrate have a marked effect on the symptoms in the conditions alluded to above (one to two drachms a day).

In acidosis also the administration of carbohydrates in easily digested form is indicated and it will be found that there is quite a large field for the use of glucose, by mouth or otherwise, for this purpose, and for purposes of nourishment in these and in many other conditions where concentrated food is needed.

#### Scarlet Fever.

While on the subject of alkalis I should like to mention a report made recently in *The British Medical Journal* in regard to scarlet fever. A great diminution of early toxic symptoms occurred when sodium bicarbonate was given in large doses. In regard to scarlet fever, you are all familiar with the work of the Dicks, who isolated the causative streptococcus from the throat. It is a useful procedure to take a swabbing from the naso-pharynx or throat, if possible, in cases of scarlet fever for diagnostic purposes, and also at the end of the illness to determine whether infection still persists and whether the disease is still transmissible; one would expect this to become a routine procedure for prophylaxis.

When muco-pus or streptococci persist in the nose and throat I am sure satisfactory douching of the

nose hastens the return to normal. A satisfactory method is to use a rubber tube with glass cylinder attached. I generally advise the "Acme" glass cylinder nasal douche, with a solution of alkaline powder—sodium bicarbonate, sodium bichlorate and sodium chloride; correct instructions should be given and douching done twice a day. This method of douching I have also found useful in chronic naso-pharyngeal infection in childhood, where infection persists after removal of adenoids and tonsils; such a condition frequently aggravates or maintains conditions of asthma or bronchitis in children. In these cases muco-pus can be seen in the naso-pharynx long after removal of adenoids. The use of sodium bicarbonate by mouth has recently been advocated by Guthrie, of Edinburgh, in such conditions.

To return to scarlet fever, prophylaxis by the use of graduated doses of toxin has been much discussed; so far in this country I believe no satisfactory standardization of toxin has been arrived at for this purpose. In the treatment of scarlet fever antitoxin has a definite value when initial symptoms are severe or when fever persists at 37.8° C. (100° F.) or more, for more than three or four days.

In severe throat infections of the scarlatinal type antitoxin is indicated early. The dose recommended is about 6,000 units—16.8 cubic centimetres (150 to 300,000 units). You will be familiar with the Schultz-Charlton test for diagnosis of scarlet fever which is of value if a positive result is obtained.

#### Pertussis.

While on the subject of infections I might mention that for pertussis vaccine treatment is used as a routine at the Children's Hospital Out-Patient Department with, I believe, good results. The condition is so distressing that any possible means of alleviating it is indicated and I have no doubt vaccine is used by most of us now. The earlier vaccine is given, the better. At present pure pertussis vaccine B, 5,000,000,000 per cubic centimetre, is given in doses of 0.3, 0.6 and 0.9 mil (5, 10 and 15 minims) every three to seven days, and the last dose is repeated once or more if symptoms persist. As to the prophylactic use of pertussis vaccine, I feel less certain, but it is surely worth a trial when there are several young children in a family.

#### Pernicious Anæmia.

I should now like to discuss very shortly the use of hog stomach in pernicious anæmia. The late Dr. Armit gave me some of a local preparation of hog's stomach to test on patients. We understood that the stomach of pigs was useless commercially and hoped that it would therefore be very cheap, but unfortunately it is not so. Bullock's liver is cheaper in this country at any rate. I have tested this hog's stomach on a few cases of secondary and pernicious types of anæmia with fairly good results, but see no reason at present why it should supplant liver, especially as there are locally prepared liver extracts which are cheaper than hog's stomach.

Comparing the imported articles, I believe hog stomach is the cheaper.

In the use of liver for anæmia, both primary and secondary, the administration of iron in some form by mouth may be a distinct help, and in a case which does not respond quickly, I would not hesitate to give hydrochloric acid and arsenic as well.

We have recently seen "Insulin" used also in pernicious anæmia to hasten recovery; undoubtedly a remarkable improvement occurs sometimes in chronic and wasting diseases when "Insulin" and glucose are given in small doses, say, ten grammes of glucose preceded by five units of "Insulin" twice a day.

#### Drug Treatment.

In regard to drug treatment you will no doubt be given the advantage of the experience of others during this course. I wish only to allude to two substances, first, "Atophan" which seems to be worth trying in almost any chronic joint condition. I have twice noted marked relief of pain from spurs of the *os calcis* following the use of this drug. Apparently there is some other factor besides mere pressure in causing the pain in that condition. Nathan Mutch mentions increased uric acid in the blood in some cases.

The toxicity of "Atophan" is well known. I have seen urticaria follow a few doses, even when followed by two grammes (thirty grains) of sodium bicarbonate in water. I have seen several cases of jaundice after its use and there have been many deaths. If it is given for four days and no longer, with intermission of three or four days, and if not more than three courses of twelve doses are given, not much harm should be done. The bicarbonate should be given at the same time.

"Luminal" in epilepsy is the other drug. There is no doubt that in combination with bromide this drug may be very helpful in *petit mal* and major epilepsy in doses of 0.03 to 0.06 gramme (half to one grain) three times a day.

#### The Benzidine Test.

The benzidine test for occult blood is now widely accepted as satisfactory for the blood in the stools and could be of considerable value in the diagnosis of carcinoma and in determining the cure of peptic ulcers, concerning the medical treatment of which the papers of Maclean and Hurst have reestablished confidence. What so many of us forget, is that it was not necessarily the same old peptic ulcer which patients used to get again and again; some people have a tendency to develop ulcers and, unless proper diet is maintained, recurrence must be quite a common event.

#### Vitamin Deficiencies.

Vitamin deficiencies and vitamin-containing substances are much before the profession and public at present. In order to apply vitamins properly, one must first diagnose the condition of deficiency. This is the difficulty. Rickets is fairly common in

Sydney and so are conditions of malnutrition which derive benefit from administration of cod liver oil, but apart from rickets I do not think there is any scientific reason for thinking that vitamin deficiency disorders are of common occurrence.

It seems to me wrong to believe without some proof that such deficiency disorders exist and, so far as I know, there is no proof of that. If we assume that a number of people suffer from vitamin defects, we must also assume that they all accidentally or intentionally correct their diet at some stage so as to prevent the obvious signs of disease appearing, and I think you will agree that the assumption would be stretching the long arm of coincidence a bit too far.

In regard to rickets, irradiated ergosterol is now known to be the necessary preventive substance, but Mellanby states that to give irradiated ergosterol by itself instead of cod liver oil is to omit vitamin A which he considers is a valuable adjunct to vitamin D (irradiated ergosterol). Vitamin D is, however, being used and we shall hear more of it later. With regard to vitamin A, Mellanby reported in 1928 the development of various infections in rats deprived of this substance and also recorded in 1929 the recovery of five patients who had puerperal septicæmia when "Radiostoleum" containing a high percentage of vitamin A was given by mouth in eight cubic centimetre (two drachm) doses twice a day. So far no report of similar results has been made here. You will recall that vitamin A is contained in milk, egg yolk, butter, green vegetables and cheese.

Vitamin deficiency disorders are as a rule rapidly cured by the administration of the proper vitamin-containing diet when such conditions are suspected. With regard to infections, however, "Radiostoleum" is surely worth a trial in the present state of our knowledge, especially in cases in which there is no definite mode of treatment.

#### ACTIONS, REACTIONS AND TRAITS COMMON TO MEN AND ANIMALS.

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#### Foreword.

THE subject treated in this paper touches many phases of psychology, which is referred to incidentally by an immense literature. I am not aware, however, that the hypothesis put forward has been treated as a direct cause and effect of many of man's actions and phases of character.

An understanding of the hypothesis might be helpful in reviewing the treatment and education of delinquent persons, those suffering from some forms of obsession, or those who are the victims of troublesome reactions or vague fears. It gives us a deeper and clearer insight into the basis of human mentality and metabolism.

Man in his long period of evolution and adaptation has retained in his physical body and biological metabolism evidence of practically every stage of vertebrate life. In this paper I hope to show that many of the actions, reactions, traits and some of the habits of man are just as akin to those of animals and birds as is his anatomical structure. Indications show that embodied in man's subconscious mind are many phases of activity that are or have been dominant in various species of animals and birds.

Seeing that parts of man's body occasionally revert and make more or less functional some obsolete section, it seems reasonable to suppose that the subconscious mind may also revert to some long past form of activity.

It is generally recognized that birds and animals do much the same things in given circumstances as man does, but the closeness of this association and its probable bearing on our social laws do not seem to have been emphasized. The similarity is indeed very marked, as a prolonged study of animals in captivity and in the field, together with reports of contemporary observers, indicates that many traits, habits, characters and emotions are common to all birds and mammals, including man. It can hardly be doubted, therefore, that with necessary modifications for each group, birds, animals and man are subject to the same general laws of behaviour. This view, if established, is important and may modify our educational and penal procedure in certain respects, for it shows that we have to search beyond human will for the genesis of many of man's actions and reactions and treat, as in disease, one unbalanced tendency rather than impose penal punishment. It would seem that our social laws have to a large extent to overcome natural urges arising from hereditary instincts.

A perusal of the evidence makes very interesting reading. It shows that, generally speaking, the manners and doings of civilized man, adapted to meet his standard of living, are only a very thin veneer, covering in most cases a different nature. Many things that he does have not any originality about them, but are based on actional tendencies that run right through the vertebrate animals. Moreover, when acting under the stimulus of special emotions, excitement or in the absence of restraint, the veneer falls away and he is apt to react in ways adverse to the well-being of himself or his fellow beings.

Such emotions as anger, pleasure, caution, fear, panic and docility are common to all vertebrates, though they may be evinced habitually in different degrees by different genera and thus give a characteristic disposition to certain families or species. Whatever the general nature of any group may be, however, individual variation both in disposition and physical character is more or less marked.

Many well formed characteristics can be mentioned that with scarcely any modification affect practically all mammals and birds in the same

degree as man. For instance, the incentive to play, evinced by all young things, can be followed by any casual observer. We all know the action of our children and household pets in this respect, but the trait is also shown where one would scarcely expect it, for even a phlegmatic hippo. has been seen to amuse himself with a piece of lead pipe as a toy. An elephant that in its youth had been taught to do tricks, for years afterwards used to relieve the boredom of doing nothing by going over these exercises. That wonderful naturalist, the late Carl Akely, has told us how juvenile elephants in the African bush used to amuse themselves by pushing about a large clay ball. They were also seen teasing young buffaloes, just as children would do to smaller animals in similar circumstances. Some birds have this incentive developed in exactly the same way. The writer once saw several young emus playing a realistic game of hide and seek. In a large well-wooded enclosure they were chasing each other, wheeling through the bushes, and often hiding behind cover, to bounce out at a passing comrade. It is noticeable that this incidence of play is chiefly evinced by both animals and children towards evening.

Field sports, which may be defined as exaggerated play, are carried out by both animals and humans in many similar actions which can only be ascribed in both cases as an endeavour to find amusement. When travelling in Kenya, I saw a hawk flying alongside the train. When a quail was flushed by the engine, the bird of prey at once gave chase, killed the victim, let it fall and again mounted into the air to wait for another. The late Mr. F. C. Morse has recorded very much the same type of action on the part of a falcon. As he walked along a river bank, ducks which were disturbed, flew up in front of him. The hawk took advantage of this and killed twelve of these birds in succession in a quarter of an hour.

A very natural form of recreation is given by otters when they slither down a steep toboggan slide of wet and slippery earth to plunge into the water at the bottom. Seals are no less to the fore in organizing games in their watery element. When observing a herd, based on Seal Rocks, off the coast of New South Wales, I saw several animals ride up to the island on the top of a wave, but just before it crashed against the land they would turn a back somersault and slide down the back of the comber on a watery switchback—an amazing performance carried out with zest and skill. Several species of birds have perfected aerial amusements. We note that such widely separated kinds as starlings and galah cockatoos carry out wonderful evolutions in flock formation. Mimic combats are apparently enjoyed by many young things, but this sport reaches its highest development in the largest kinds of the supposedly primitive marsupials, the great grey and the red kangaroos. The bucks of both these species frequently indulge in stand-up contests in which several rounds, with a rest between each, are carried through.

Quite another set of incidents can be noted when we come to the feeding habits of animals. In these the human type has necessarily drifted away from the more primitive beings, but it would seem, nevertheless, that certain incentives still persist and are responsible for certain actions in humans in which a particular urge may become dominant. It seems a truism to say that all things must find their food, but from this probably arises the strong incentive for boys to collect birds' eggs and sundry things when opportunity occurs. Some species of rodents, notably squirrels and beavers, make a habit of storing up food for winter use. Certain rats also have this habit, although perhaps no winter scarcity may operate in their case. We find this urge again in butcher birds and other species. May not this storage factor become dominant in some humans and lead in extreme cases to the more intensive miserly action occasionally noted in man? People would not live in unnecessary stress and starvation, when they have the ample means, unless dominated by some inherited urge. Another phase of the collecting habit can be found in certain species of birds, notably bower birds, which habitually collect coloured objects to decorate their playgrounds, or in the case of the European magpie, seemingly because they are attracted by bright things. It would seem that this urge is dominant in kleptomaniacs or people who have an irresistible desire to pick up or steal things they do not really need.

Singing is a factor that is very common in man, dominant in certain species of birds, and to be noted occasionally in animals. This trait naturally bursts forth in the absence of restraint and is a sign of happiness; therefore notes made when things are not frightened, angry or calling their mates, may be taken as sounds denoting pleasure. Such can be noted in the song of birds, the purring of a cat, or the crescendo given forth by a dog when he sees signs of being taken for a walk or taken hunting. The little sun-bear makes a humming sound of contentment and many other animals make sounds denoting the same thing.

Closely associated with singing is dancing which is also a habit of pleasure. Its existence in practically every race of mankind is well known. It is a dominant practice amongst certain species of cranes and birds of paradise, as well as being indulged in to a less degree in some other species of birds. Amongst mammals ebullitions which can be ascribed to dancing, are more rarely observed, perhaps because conditions insuring absolute freedom from restraint and observation are not often offered. If looked for, however, movements of this character can be seen to be associated with their play. The chimpanzee has this habit well developed and gets pleasure in going through a set performance. This movement is quite a natural one and seemingly characteristic to this species of ape. A male in Taronga Park, Sydney, starts his dance with a slow stamping of the feet, which movement, gradually increasing in vigour and pace, ends in a wild romping, accompanied by loud calls. The per-

formance is not at all unlike that given by some dark races of man. Some species of monkeys, notably *Macacus rhesus*, when comparatively free in a large open air enclosure, often dance and romp about on the highest part of their hillock.

Throughout many orders of animals and birds we find a marked tendency to dwell in companies and communities. These groups are usually under the dominance of one or more individuals. Many species of birds and also some animals post a scout or lookout in a prominent position, whose sole duty it is to give warning if danger approaches. These and other features show that animal groups are more or less organized. Contingent on this phase of character there seem to be three natural laws that have a direct bearing on the conduct of both humans and animals. These can be formulated as follows:

Law of individualism or speciation centres thoughts on self and generally induces prejudice against and disinclination to associate with other species or groups.

Law of groups bands together those of similar species, temperament, desires or habits.

Law of dominance brings out the natural leader of any group and induces others to submit to his will and guidance.

This group factor, which is so often seen in the animal kingdom, plays a similar and equally important part in human affairs. Man is naturally gregarious, but subgroups of similar nationality, temperament, calling and desires are mutually banded together into clubs, societies, religious organizations, political groups and states. The inner inherited drive of this separation or community urge is all powerful and, as among animals, tends to keep humans sectionized and isolated from each other. Reason and convenience would tend to break down many artificial barriers between peoples. This dividing force, however, engenders individualism, as well as prejudices against other groups, and hinders any wide cooperation.

In these laws we can see the operation of the natural cause of speciation. Any section that becomes more or less isolated, adapted to a special environment and developing certain habits arising from the mode of living, would in time become a separate race and ultimately a distinct species. The many racial divisions of the *genus homo* indicate the operation of this law. We have abundant evidence to show that as strong tribes or nations formed, they absorbed or destroyed their weaker neighbours. This has apparently prevented any distinct generic forms from remaining.

If one were tempted to apply this factor in a wide sense, it could be postulated that the congeries of peoples that have gone to make up the United States of America, being more free from the hold of natural conservatism, are better able to develop and exploit every avenue of trade and science that offers, while countries which have a nationalism, reaching far back into the past, are more or less bound and fettered by traditions and temperament that hamper spontaneous advancement.

Human beings often show sensificals that are in the ordinary way hard to account for. It would seem that these are reactions coming out in individuals in which a natural incentive urge is dominant or which is not quite counteracted by what might be termed normal guard sense against abnormal tendencies. People, otherwise rational, become obsessed with quite needless fear of various things. This fear may be a reaction that is stronger than reasoned thought and thus be uncontrollable. For instance, we find people driven frantic by the sight of a fluttering moth, others cowed and terrified by thunder or worried by a haunting fear of being robbed. Again, people at times react to temptation or opportunity and do things of which they would normally be ashamed.

We can find many counterparts for these feelings and reactions in animals. For instance, horses and other mammals may become uncontrollable in the presence of certain parasitic flies. Many species of birds and animals are endangered and at times killed by electrical disturbances. Orang-utans are specially susceptible to these conditions. One can imagine that animals that store food for the winter, must always be troubled by the fear of losing their hoard.

Support for the hypothesis put forward is also found in the occasional abnormal response of man to certain drugs.

Dr. John MacPherson, of Sydney, has given me the following instances of this:

Morphine in the human subject is a powerful depressant. It relieves pain and produces mental quiet and sleep. It also checks vomiting. In morphine poisoning the vomiting centre is so powerfully depressed that it may be impossible to produce vomiting. In the dog morphine typically causes vomiting, and this effect is sometimes seen in human beings. In cats and other *felidae* this drug typically causes, not depression, but excitement. This effect also occurs at times in humans, especially Malaysians. Different species of animals vary enormously in their response to bacterial infections and their reaction to bacterial toxins. Exactly the same is to be noted in human individuals.

Finally, we sometimes see animals and birds doing things beyond the normal course of their activities. Action is not infrequently based on thought to secure a definite result. Curiously enough, such actions coming under this category are just what people would do under similar circumstances. Dr. John MacPherson gives a typical instance. A tame magpie which he had in Glen Innes, deliberately indulged in the pastime of teasing, just as young humans do. On a winter's night the magpie would occupy the fender before the fire and the cat would sleep on the hearth rug in front of it. When satisfied that the cat was asleep, the magpie would sharply pull his whiskers or tail and immediately put his head under his wing and feign sleep. The rudely awakened cat would look round and failing to discover the offender, would again sleep, to be again awakened by a similar method. He would carefully survey the magpie, who was seemingly sound asleep. All these manoeuvres would be repeated until the cat left the room in indigna-

tion, when the magpie would really go to sleep. Dr. William T. Horniday, for many years Director of the Zoological Gardens in Bronx Park, New York, has in his "Minds and Manners of Wild Animals" given a great many instances of unusual mental activity in animals, and I fully endorse the construction he puts upon them.

The data cited have been chosen at random from a great many similar observations, which could be multiplied almost indefinitely. It would seem, then, that man in his body and mind and the resultant actions therefrom is an almost complete embodiment of the lower animals, combining in some degree the attributes of all species. We note that while some actions are common to all, others only develop in certain, but possibly widely different, groups of either men, animals or birds. Any of these tendencies may, however, become dominant in individuals, causing an inherited urge to overcome normal action. A man may have quite a definite wish not to do certain things which are against his own well-being or the laws of his country. His subconscious mind, however, may be dominated by a certain instinctive urge which in the environment that allows of opportunity must drive him to action or allow a detrimental reaction to get past his conscious guard sense. To put this more concisely, we can adapt an idea given by Andrew Jackson Davis ("Harmonial Philosophy"):

Materially and psychologically man possesses affinities which he did not create and cannot easily control. He is compelled to act, as he is acted upon, by his subconscious and unbalanced instincts and thus manifest characters or actions according to his inherited tendencies.

The more we understand about this subject, the more rational should be our behaviour. Recognition of the cause of a harmful action is the first step to being able to cure it. The aim is to set conduct to reason through our educative and judiciary systems.

ACTIVE IMMUNITY AGAINST *BACILLUS*  
*ŒDEMATIENS*, WITH SPECIAL REFERENCE  
TO BLACK DISEASE OF SHEEP AND THE  
POSSIBILITY OF THE PREVENTION OF GAS  
GANGRENE IN MAN: A PRELIMINARY  
COMMUNICATION.

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BLACK disease is one of the more important diseases which affect sheep in Australia. It is an enzootic disease, usually showing a seasonal exacerbation from January to May. It is widely distributed in the country. Its great economic importance is generally recognized and this investigation was undertaken in the hope that it would make available a safe, efficient and economical agent for active immunization.

In common with other workers<sup>(1) (2) (3)</sup> in this country, we have found bacilli resembling *Bacillus Œdematiens*<sup>(4)</sup> present in the necrotic areas of the liver. In all points except morphology the strains we isolated resembled a classical strain of *Bacillus Œdematiens* from the Lister Institute collection. We found that the vaccine prepared from one of the strains obtained from Tasmanian material protected guinea-pigs against lethal doses of the Lister Institute culture. The observations of other workers and our own experience make it exceedingly likely that *Bacillus Œdematiens* is the causal microorganism of black disease, though owing to the difficulty of producing the disease experimentally the question can best be settled by actually attempting to protect flocks against it in some portion of the field where it is prevalent.

This organism is also of great importance in human pathology as one of the three organisms most frequently associated with gas gangrene. The ease with which active immunity can be produced against pathogenic anaerobes in laboratory animals and in sheep makes the active immunization of man a practical possibility. In the last war the mortality from gas gangrene was extremely heavy and, although serum treatment did seem to have beneficial results in some cases, there can be little doubt that if an effective active immunity against the toxins of *Bacillus welchii*, *Vibrio septique* and *Bacillus Œdematiens* could be safely produced in the human subject, a real step forward would have been made in military medicine.

It has been possible for us to procure from diseased material four strains of *Bacillus Œdematiens* associated with different outbreaks of "black disease." They are representative of the Australian type of the organism, having been obtained locally from Gippsland (Victoria) and from Tasmania. In addition *Bacillus Œdematiens* (Lister Institute) and *Bacillus Œdematiens* (Albiston) were incorporated in this investigation for comparative purposes.

In the course of this study the following media were used: (i) Hartley's trypsin broth, (ii) tryptic agar, (iii) serum agar to which liver extract was added, (iv) trypsin cooked meat broth, (v) peptic digest broth obtained by the peptic digestion of liver and meat. This latter medium was used for toxin production.

We have found it exceedingly difficult to isolate *Bacillus Œdematiens* from the liver of sheep which have been dead for some time, and, with one exception, the cultures with which we have worked, have been obtained from ailing sheep which were killed. Immediately after death the cultures were made in Robertson's cooked meat medium from the necrotic areas in the liver.

Initially, difficulty was found in obtaining subcultures from the original culture. Although a vigorous growth of *Bacillus Œdematiens* was obtained in the first instance, after a few days no growth could be got on subculturing into the same

medium. Realizing that the old culture consisted of degenerated vegetative forms and spores, the spores only being available for further growth, we tried various other media, usually used for the cultivation of anaerobes, and found Tarozzi's medium (fresh tissue in boiled broth) very useful for our purpose. The latter medium produced a very good growth overnight without using an anaerobic apparatus. The grave danger of contaminated media was recognized and eventually we discovered a simple and perfectly safe medium which gave an abundant growth in twenty-four hours, without using anaerobic precautions (trypsin cooked meat broth).

For simple manipulation and to insure a pure culture, a surface growth on some solid medium is desirable. After many unsuccessful experiments with various enrichment methods,<sup>1</sup> we finally found an excellent medium which produced large discrete colonies in twenty-four to forty-eight hours, namely, serum agar to which liver extract was added. In using this medium it is essential to use rather generous quantities of a young, active culture. From old cultures consisting of degenerated vegetative forms and spores, we have never succeeded in obtaining a surface growth.

At this stage, having found a fairly simple technique for satisfying the rather fastidious requirements for growth of *Bacillus oedematiens*, the next step was to obtain pure cultures. The following procedure was adopted:

1. The original culture from the necrotic liver in cooked meat medium was heated to 80° C. for one hour.
2. A generous quantity of the heated culture was introduced into the lower layers of the trypsin cooked meat broth medium with a Pasteur pipette and incubated for twenty-four hours.
3. After twenty-four hours the actively growing cultures were used to inoculate well dried plates of serum agar to which liver extract was added. These plates were immediately transferred to an anaerobic apparatus and anaerobiosis produced as quickly as possible. In from twenty-four to forty-eight hours discrete colonies of *Bacillus oedematiens* were obtained. Usually no other anaerobes were found. Immediately on opening the anaerobic jar typical colonies were selected from the plates, quickly "stroked" on well dried plates of the same medium and as rapidly as possible transferred to the anaerobic jar. This subculturing was repeated three times. From the final plates typical colonies were selected and transferred to trypsin broth meat tubes and incubated for twenty-four hours. These tubes were used as the primary source for all further cultures.

If the surface colonies are exposed to the atmosphere for more than about fifteen minutes, no growth

may be found on surface subcultures. If desired, subcultures may be obtained in trypsin cooked meat broth from colonies which have been exposed to the atmosphere for a considerable time.

The anaerobic plating work was carried out in MacIntosh and Fildes jars which were found most excellent for the purpose.

#### Morphology.

In young cultures in cooked meat media short forms of about three to five microns predominate. In older cultures and surface colonies the bacilli were found to be much longer and chain formation is common. *Bacillus oedematiens* (Lister) is usually smaller than *Bacillus oedematiens ovis* (Albiston)<sup>(3)</sup> and our strains, though from surface colonies we have occasionally found it to approximate in size to that of the other strains.

#### Cultural Characters.

Separate colonies on serum agar to which liver extract was added, usually attain a diameter of from two to four millimetres in forty-eight hours at 37° C.. A halo surrounding the colonies is generally seen, probably due to the precipitation by the acid produced of the serum protein contained in the medium. The colonies are flat, on dry plates fairly symmetrical, with a periphery of short, delicate, branching filaments. The only cultural difference we have found between *Bacillus oedematiens* (Lister) and the strains isolated from black disease is the apparently greater tendency of the former to produce a surface film. Cultures of *Bacillus oedematiens* possess a characteristic odour which is reminiscent of cabbage water, particularly when the cultures have remained for some time in the incubator.

#### Saccharolytic Properties.

Widely different fermentative properties of *Bacillus oedematiens* have been described by various workers. For our own part, we have found no difference between our strains and *Bacillus oedematiens* (Lister) and *Bacillus oedematiens ovis* (Albiston). Our results agree with those published by the Medical Research Committee upon anaerobic bacteria,<sup>(5)</sup> but differ from results obtained by Edgar in this country who found fermentation in galactose. We used a modification of McEwan's medium and the tubes were examined after incubation for four days in an anaerobic jar.

The appended results (Table I) collected from various sources, illustrate the diversity of fermentative properties ascribed to *Bacillus oedematiens* by different observers. Contrary to the opinions held by some workers, we believe that the carbohydrate fermentative properties of certain of the anaerobes provide a valuable means of identification.

#### Toxin Production.

The best medium with which we experimented, was a peptic digest of liver and bullock's heart, though trypsin broth is almost as useful. In common with other workers, we found that forty-eight hours'

<sup>1</sup> More recently we have found that one of the strains of *Bacillus oedematiens* isolated by us from black disease and which has been subcultured many times, will now grow on the surface of blood agar plates, though the growth is not so luxuriant as on serum agar to which liver extract has been added.

TABLE I.

Medium.	Medical Research Council.	Authors' Results. Four Types from Black Disease and <i>Bacillus oedematiens</i> (Albiston) and <i>Bacillus oedematiens</i> (Lister).	Henry.	Kahn.	Quoted by Park and Williams.	Edgar. <i>Bacillus oedematiens</i> from Black Disease.
Arabinose .. .. .		+				
Xylose .. .. .		+	+			+
Rhamnose .. .. .		+	+			
Glucose .. .. .	+	+			+	+
Mannose .. .. .		+		+		
Galactose .. .. .	-	+		+		+
Levulose .. .. .	+	+	+			+
Saccharose .. .. .	+	+		+	+	+
Maltose .. .. .	+	+	+		+	+
Lactose .. .. .	-	-			+	-
Raffinose .. .. .		-	+	+	+	-
Starch (not soluble variety) ..		-			+	
Inulin .. .. .	-	-		Acid		-
Dextrine .. .. .		-				
Glycerine .. .. .	-	+			+	
Inosite .. .. .		+				
Sorbitol .. .. .		-				
Erythrite .. .. .		-				
Mannite .. .. .	-	-				-
Dulcitol .. .. .		-				-
Amygdalin .. .. .		-				-
Saline .. .. .		-				-

growth gave the best available toxin. After that optimum time the growth practically ceases and the toxin rapidly deteriorates.

For the titration of toxin mice have been used almost exclusively. The following was adopted as the minimum lethal dose, that is to say, the smallest amount of toxin injected subcutaneously that will kill healthy mice weighing from thirteen to fifteen grammes in two to three days. The dose was so adjusted that 0.2 cubic centimetre volume was consistently used.

Seitz asbestos mat filters were not very suitable for filtration, as they were found to absorb about 50% of the available toxin. Chamberland candles were found to be more pervious to the toxin and were used in the preliminary search for a highly potent product.

Considerable variation in the amount of toxin elaborated by our strains was found to exist. A strain from a Gippsland outbreak of black disease produced a toxin having  $\frac{1}{250}$  cubic centimetre as a minimum lethal dose for the mouse. The Lister strain gave  $\frac{1}{1200}$ , Albiston strain  $\frac{1}{2000}$ , and another Victorian strain  $\frac{1}{1000}$  cubic centimetre. Of two strains from the same outbreak in Tasmania one gave a minimum lethal dose of toxin of  $\frac{1}{2000}$  and the other  $\frac{1}{3000}$  cubic centimetre.

Since the reaction of the broth after forty-eight hours' active growth is usually between pH 5.2 to 5.6, we thought the inhibition of growth and rapid deterioration of toxin might be due to the high acidity produced. As far as growth was concerned, we found on adjusting the pH of the broth to the original value no further growth, as evidenced by gas production, took place.

As a routine procedure for the production of toxin in large quantities, peptic digest broth with a layer of about ten centimetres (four inches) of cooked meat covering the bottom of large bottles or flasks has been used. The vessel is fitted with a

rubber stopper with two bent leads of glass with rubber connexions and screw clips. About one hundred cubic centimetres of a young culture in peptic digest broth and cooked meat were used as an inoculum for each two thousand cubic centimetres and hydrogen passed through to replace the air in the free space of the vessel.

#### Vaccine Preparation.

From the commencement of this work we had the work of Ramon on formalized diphtheria toxin in mind and realized that if the production from our strains of a high grade toxin in large quantities were possible, a preparation analogous to an anatoxin might solve our problem.

A perfectly clear filtrate from the peptic digest broth culture was obtained by filtration through ordinary filter paper. The filtrate was adjusted by means of sodium hydrate to pH 8.2, 0.3% of formalin was added and it was then incubated at 37° C. until the product was non-toxic to guinea-pigs in doses of five cubic centimetres. This usually took about seven days. At this stage the surface of the vaccine was covered with toluol. To prove the safety of the preparation we injected ten to thirty cubic centimetre doses into twenty sheep of various ages. No toxic symptoms developed.

This formalized product is remarkably stable and no loss of antigenic properties has been found after storing for nine months. We consider that our vaccine is essentially an anatoxin; the few organisms that may have passed the filter were probably insufficient to have any material effect in the immunization process.

#### Active Immunization against *Bacillus Oedematiens*.

Preliminary orientating experiments having given fair evidence of the possibility of actively immunizing guinea-pigs by means of *Bacillus oedematiens* vaccine, we felt justified in carrying out tests on a

large scale. The results obtained with guinea-pigs in one experiment are set out in Table II. From this table it is seen:

1. That twelve vaccinated guinea-pigs were protected against certainly fatal doses of the living culture, while twelve unvaccinated controls all succumbed to the test doses within twenty-eight hours.

2. That six guinea-pigs, that is to say, Numbers 1 to 6 inclusive, were protected against not less than five fatal doses.

3. That one dose was sufficient to produce effective protection. One-twentieth cubic centimetre of culture was found to kill two guinea-pigs out of two inoculated and 0.01 cubic centimetre killed one out of two. While these numbers are small, it is reasonable to believe that in many of our guinea-pigs we protected against ten lethal doses and probably in some of them against fifty.

Weinberg and Prevot<sup>(6)</sup> found that guinea-pigs could be immunized with *Bacillus oedematiens* anaculture only by means of a massive dose. We, on the other hand, found that a small single dose of our vaccine could efficiently immunize guinea-pigs against *Bacillus oedematiens* culture. The formalized vaccine we employed in this experiment was eight months old when we commenced the immunization of the guinea-pigs, so that we believe it to be a very stable product. The test material used was peptic digest broth culture grown at 37° C. for twenty-four hours.

Turner (1928),<sup>(7)</sup> working at the Pasteur Institute, published the results of his endeavours to vaccinate guinea-pigs with anaculture. He started his experiment with sixty guinea-pigs, but before

he actually applied his test dose, there were only twenty-eight survivors. This heavy mortality during the period of immunization was attributed to an epizootic disease prevailing amongst the animals, but since no control group of animals is described in detail, one must always consider the possibility that part at least of the mortality was due to the vaccination process. In respect of the twenty-eight animals that survived sufficiently long to be submitted to the test dose, several points of interest call for consideration.

First of all, the number of animals used to determine the minimum lethal dose of the test culture is not stated and the reliability of this control must be established before the value of the experiments can be determined.

Secondly, accepting the minimum lethal dose given by Turner, the next most striking feature of the experiment is the erratic results obtained from the immunization. Some guinea-pigs that received two immunizing doses, were not able to withstand even one fatal dose of the culture.

Thirdly, of four animals that had received a single dose of vaccine, only one died when they were submitted to the test dose of two and a half minimum lethal doses of culture, while in the case of five of those animals that had received three doses of vaccine and were tested with two minimum lethal doses of culture, no less than three died, suggesting that the three doses of vaccine had been less effective than the single dose, a result which seems to be at variance with one of Turner's deductions from the experiment.

Striking features of our guinea-pig experiment are the regularity (a) of the susceptibility of the

TABLE II.  
Immunization of Guinea-pigs with One Dose of Anatoxin.  
(All inoculations subcutaneous.)

Number of Guinea-pig.	Date of Vaccination and Amount.	Date of Test and Quantity of Culture.	Days of Observation.			Remarks.
			1	2	3	
1	May 9, 1930.  All given 2 cubic centimetres of anatoxin	May 23, 1930.  Each given 0.5 cubic centimetre of culture	-	-	-	All alive after fourteen days.
2			-	-	-	
3			-	-	-	
4			-	-	-	
5			-	-	-	
6			-	-	-	
7		Each given 0.1 cubic centimetre of culture	-	-	-	
8			-	-	-	
9			-	-	-	
10			-	-	-	
11			-	-	-	
12			-	-	-	
13	Unvaccinated controls	Each given 0.5 cubic centimetre of culture	+	-	-	All dead within nineteen hours.
14			+	-	-	
15			+	-	-	
16			+	-	-	
17			+	-	-	
18			+	-	-	
19		Each given 0.1 cubic centimetre of culture	+	+	-	All dead within twenty-eight hours.
20			-	+	+	
21			-	+	+	
22			-	+	+	
23			-	+	+	
24			-	+	+	

The pigs used for the experiments recorded in this table averaged 350 grammes weight.

TABLE III.

*The Value of Anatoxin as an Immunizing Agent in Sheep.*

Number of Experiment.	Serial Number of Sheep.	Dates of Vaccination.		Doses of Anatoxin in Cubic Centimetres.		Date of Test.	Quantity of Culture used in Test in Cubic Centimetres.	Days of Observation After Inoculation of Test Dose.						Remarks.	
		First.	Second.	First.	Second.			1	2	3	4	5	6		
1	1 2c	7/5/30 —	14/5/30 —	10 —	5 —	27/5/30 27/5/30	5 5	— —	— —	— +	— —	— —	Still alive to date 24/7/30.		
2	1 2 3c 4c	31/5/30 31/5/30 — —	— — — —	10 10 — —	— — — —	13/6/30 13/6/30 13/6/30 13/6/30	5 5 5 5	— — — —	— — — —	— — — +	— — — —	— — — —	} Still alive to date 24/7/30.		
3	1 2 3 4 5c 6c	31/5/30 31/5/30 31/5/30 31/5/30 — —	6/6/30 6/6/30 6/6/30 6/6/30 — —	5 5 5 5 — —	5 5 10 10 — —	19/6/30 19/6/30 19/6/30 19/6/30 19/6/30 19/6/30	5 5 5 5 5 5	— — — — — —	— — — — — —	— — — — + +	— — — — — —	— — — — — —		} Still alive to date 24/7/30.	
4	1 2 3c 4c	28/6/30 26/6/30 — —	— — — —	5 5 — —	— — — —	11/7/30 11/7/30 11/7/30 11/7/30	5 10 5 10	— — — —	— — — —	— — — +	— — — —	— — — —			} Still alive to date 24/7/30.

normal guinea-pigs to whole culture, (b) of the immunity of the vaccinated guinea-pigs to the same material, and (c) of the potency of single doses of vaccine as immunizing material.

A similar experiment was carried out on sheep, in this instance in four stages; however, owing to the cost of the experimental animals. The results obtained from the experiment are set out in Table III. From this experiment we see: (i) That all of nine vaccinated sheep, when tested with doses of living culture, withstood the inoculation successfully; (ii) that the control sheep, seven in number, all succumbed to the same doses; (iii) that four sheep out of four were immunized successfully with single doses of vaccine, while the four uninoculated controls given the same doses of culture all died.

We conclude, therefore, that the vaccine used is a very satisfactory immunizing agent in the sheep.

Turner (1928),<sup>(7)</sup> also in the Pasteur Institute, vaccinated sheep against *Bacillus oedematiens*. His experiment demonstrates that anaculture will produce good immunity. The experiment involved fifteen sheep, five of which were used as a control. It should be mentioned that the test dose given to the once vaccinated animals was not invariably able to kill the unvaccinated controls.

Further, his experiments on sheep do not show that three immunizing doses are more effective than one. All the sheep immunized by either method survived the test doses. It must be admitted that larger test doses were used with some of the animals that had had three immunizing doses, but since the larger doses were not used for the tests in sheep that had only been immunized with one dose of anaculture, we cannot presume that these animals could not have supported them.

TABLE IV.

*An Experiment to ascertain whether Anatoxin made from a Tasmanian Strain, Bacillus edematiens (Parker), was capable of Immunizing against Bacillus edematiens (Albiston) and Bacillus edematiens (Lister).*

Number of Experiment and Organism used as Test.	Number of Guinea-pig.	Date of Vaccination.	Quantity of Anatoxin in Cubic Centimetres.	Date of Test.	Quantity of Culture used in Test in Cubic Centimetres.	Days of Observation After Inoculation of Test Dose.				Remarks.
						1	2	3	4	
I. <i>Bacillus oedematiens</i> (Lister) ..	1	4/6/30	2	7/7/30	0.5	—	—	—	—	} All alive at end of observation period of fourteen days.
	2	4/6/30	2	7/7/30	0.5	—	—	—	—	
	3	4/6/30	2	7/7/30	0.5	—	—	—	—	
	4	4/6/30	2	7/7/30	0.5	—	—	—	—	
	5c	—	—	7/7/30	0.5	+	—	—	—	
	6c	—	—	7/7/30	0.5	—	+	—	—	
	7c	—	—	7/7/30	0.5	—	+	—	—	
	8c	—	—	7/7/30	0.5	—	+	—	—	
II. <i>Bacillus oedematiens</i> (Albiston)	1	4/6/30	2	7/7/30	0.5	—	—	—	—	} All alive at end of observation period of fourteen days.
	2	4/6/30	2	7/7/30	0.5	—	—	—	—	
	3	4/6/30	2	7/7/30	0.5	—	—	—	—	
	4	4/6/30	2	7/7/30	0.5	—	—	—	—	
	5c	—	—	7/7/30	0.5	+	—	—	—	
	6c	—	—	7/7/30	0.5	—	+	—	—	
	7c	—	—	7/7/30	0.5	—	+	—	—	
	8c	—	—	7/7/30	0.5	—	+	—	—	

TABLE V.

*An Experiment to Test the Durability of the Active Immunity produced by the Vaccination of Guinea-pigs against Bacillus œdematiens.*

Number of Guinea-pig.	Date of Vaccination and Amount.	Date of Test and Quantity of Culture.	Days of Observation.			Remarks.
			1	2	3	
1 2 3 4	Each given 2 cubic centimetres of anatoxin. June 4, 1930.	Each given 0.5 cubic centimetres of culture. July 25, 1930.	—	—	—	Still alive to date, August 11, 1930.
			—	—	—	
			—	—	—	
			—	—	—	
1 2 3 4	Unvaccinated controls.	Each given 0.5 cubic centimetre of culture. July 25, 1930.	+			
			+			
			—	+		
			—	+		

**The Similarity of Bacillus œdematiens (Parker) to Bacillus œdematiens (Albiston) and Bacillus œdematiens (Lister).**

To demonstrate the similarity of the toxin we were preparing to that of *Bacillus œdematiens*, we actively immunized eight guinea-pigs with our vaccine and demonstrated that they were rendered immune to certainly fatal doses of *Bacillus œdematiens* culture of either the Albiston or Lister strains. The results of these experiments are shown in Table IV. From this work, therefore, we concluded that we were working with an *œdematiens* strain and, further, that the strain was similar to that isolated by Albiston. Similar experiments showed that Tasmanian strain (Parker) vaccine protected guinea-pigs against the other strains that we had isolated.

**Erratic Results of Immunization.**

The erratic results obtained by various authors with anaculture immunization with the guinea-pig depend on factors that have not yet been fully investigated. If they should operate also in the case of the sheep, then some imperfections of our field results are to be expected.

**Durability of the Immunity.**

Our experiments to demonstrate immunity have usually been conducted about a fortnight after the last immunizing dose was given. It seemed desirable, therefore, to immunize a group of guinea-pigs actively and test them at intervals to see how long they retained their immunity. Four such guinea-pigs that had been immunized on June 4, 1930, by single doses of vaccine, two cubic centimetres in quantity, were submitted to tests on July 25, 1930. The results are shown in Table V. The immunity was still present after seven weeks. These experiments will be continued from month to month to get an exact measure of the duration of the immune state.

**Conclusions.**

1. An efficient active immunity in guinea-pigs and sheep can be safely produced by a single dose of the vaccine described.
2. We believe it would be advisable to repeat this work in the monkey with a view to its application to man, if such should be necessary.

**Acknowledgements.**

For facilities for carrying out the sheep tests at Yarraview we are indebted to the generosity of Captain Arthur Payne, and for practical help and supervision of the work there our thanks are due to his manager, Mr. Moses.

The rest of the work has been carried out at the Baker Medical Research Institute, under a grant provided by Mr. H. S. Rudduck, Veterinary Surgeon, Melbourne, who has also been our valued adviser in the veterinary aspects of the problem.

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**Reports of Cases.**

**ANAPLASTIC CARCINOMA OF THE LIVER.**

By RUPERT A. WILLIS, M.D. (Melbourne),  
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Victoria.

**Clinical History.**

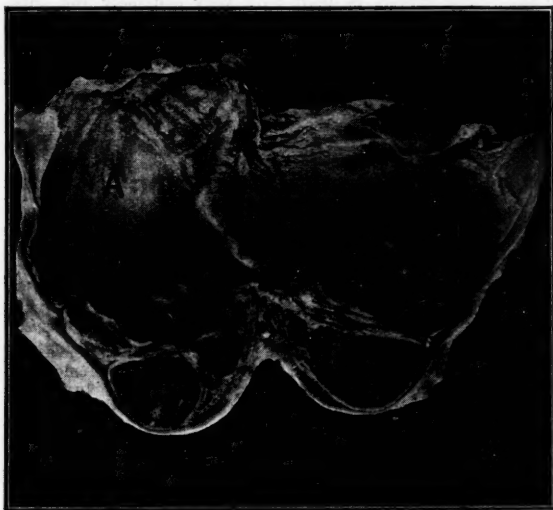
In January, 1929, a male patient, forty-seven years of age, first noticed progressive asthenia and loss of weight. A month later he attended a public hospital with an

attack of right-sided "pleurisy." This improved, but persistent abdominal pain after food soon appeared, accompanied later by occasional vomiting. Late in March he noticed a mass in the epigastrium. He was admitted to the Austin Hospital in April under a diagnosis of "carcinoma of the stomach."

Examination disclosed extreme emaciation and prominent abdominal distension. Enormous irregular enlargement of the liver was present, the lower edge of the organ reaching the navel in the mid-line. A small quantity of free fluid was present in the flanks. General examination revealed no other abnormalities. The Wassermann test yielded no reaction. The patient's condition declined rapidly, the hepatic enlargement steadily increased, and it was felt to be futile to carry out any special investigations. An erythema dose of deep X ray therapy failed to effect any result. Death occurred in June, 1929, the duration of the illness having been only five months.

#### Autopsy Findings.

Both lungs presented many scattered small growths, and almost all mediastinal glands contained massive neoplastic deposits. The thoracic duct was obliterated and largely replaced by nodular tumours, and the left supraclavicular glands were involved. The liver weighed 4,075 grammes (144 ounces) and contained very numerous large tumours. Nodular neoplastic invasion of both portal and hepatic veins in the organ was a prominent feature. The portal, suprapancreatic, coeliac and upper lumbar lymph glands contained large tumour deposits, and the *receptaculum chyli* was obliterated. Both kidneys contained a few small tumours. The adrenals, spleen, pancreas, alimentary tract, bladder and prostate were normal. Both testes were small but normal. There was a widely patent but empty inguinal hernial sac on the left side, extending to the upper pole of the testicle. At the bottom of this sac was a group of pedunculated nodules of metastatic growth, the largest 1.5 centimetres in diameter (see figure). The walls of the sac elsewhere were normal. The



The hernial sac and testicle have been divided by a vertical incision and the parts opened out. A is the normal serosa of the upper portion of the sac. B is the testicle in section. The arrow indicates the group of metastatic deposits on the floor of the sac.

parietal, and to a less degree the visceral, peritoneum presented scattered small tumour nodules. The recto-vesical pouch contained a thick mass of malignant tissue which, however, did not infiltrate the rectal wall. Several pints of clear fluid were present in the peritoneal cavity. The brain was normal, but the dura contained several small metastases. The thyroid was normal.

#### Histological Findings.

Numerous sections of most of the organs involved exhibit a uniform structure throughout. The tumours consist of diffuse masses of round or polyhedral cells with scanty protoplasm and opaque hyperchromatic nuclei. No sign of differentiation is anywhere discoverable; but the general arrangement of the cells suggests a disorderly, highly anaplastic carcinoma rather than a sarcoma, a belief strengthened by the abundance of lymph gland metastases. Central necrosis is frequent in the larger tumours. Mitotic figures are plentiful.

#### Diagnosis.

The massive involvement of the liver with no primary tumour in the viscera of the portal area suggests that the neoplasm arose in the liver itself. The multiple scattered growths in the lungs, kidneys, peritoneum and *dura mater* were clearly metastatic in nature and none of these could be regarded as a likely primary tumour. The multiplicity of the liver tumours confirms rather than militates against an hepatic origin, for carcinoma of the liver frequently disseminates itself within the organ by invasion of portal venous channels, a condition abundantly evident in the present instance.<sup>(1)(2)</sup> Plentiful penetrations of the growths into the hepatic efferent veins were also present in the case under discussion, and detached emboli from these must be regarded as the origin of many of the widespread metastases in the lungs, supplemented probably by further emboli liberated during invasion of the thoracic duct and reaching the venous circulation by that route. It is concluded, therefore, that the tumour was a rapidly growing, highly invasive, anaplastic carcinoma of the liver with extensive intrahepatic dissemination *via* the portal veins and metastases thence to the lungs and other viscera. The peritoneal metastases probably arose by direct trans-celomic spread from the liver.

#### Comments.

Noteworthy are:

1. The peculiar type of the tumour and the several evident routes of its dissemination.
2. The formation of a massive implantation metastasis in the recto-vesical pouch, the so-called "Douglas metastasis."<sup>(3)</sup>
3. The presence of an isolated group of implantation metastases in a hernial sac. This condition is of interest in connexion with the discussion of the mechanism of metastasis in serous cavities. Recently some writers have expressed doubt regarding the occurrence of trans-celomic dissemination and implantation of tumours and have upheld the view that military peritoneal carcinomatosis arises entirely by continuous permeation of the subserous lymphatics. There is, of course, no doubt that the latter process frequently occurs, but it appears to the writer to be unjustifiable to rely entirely on this process for an explanation of widespread peritoneal involvement. The condition figured in the present report strongly supports the transperitoneal implantation theory.

The walls of the neck and upper parts of the hernial sac were entirely free of malignant deposits which were restricted to the localized group of growths at the most dependent part of the cavity. Such a distribution is inexplicable by lymphatic permeation, and the highly probable origin of these nodules by transcelomic deposition of free malignant cells is obvious.

#### Acknowledgement.

I have to thank Mr. H. Trumble, F.R.C.S., for his consent to my recording the clinical history of this patient.

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## Reviews.

### HYGIENE OF THE MOUTH.

DR. SIM WALLACE's book on oral hygiene and recent research is composed of twelve chapters which were originally independent communications having reference to oral hygiene.<sup>1</sup>

According to the author of this work, the cause of dental caries is known and its prevention is simply a matter of application of the knowledge. Briefly, the causation of dental caries is carbohydrate stasis with resulting formation of lactic acid and destruction of the enamel.

One forms the opinion that in his zeal for his theory the author becomes carried away with himself and indulges in much invective against various people, particularly Professor and Mrs. Mellanby in their advocacy of the importance of vitamins in relation to dental caries. The Medical Research Council comes in for its share of the slating for its alleged indifference in the matter of prevention of dental caries.

A copy of a leaflet on the "Prevention of Decay of Teeth" for the use of parents is reproduced in this work. One gains the impression that Dr. Wallace believes we have only to follow the advice given in this leaflet and the problem of dental caries in children will be solved.

The claim that dental caries in school children in England has been reduced by more than 20% appears rather extravagant.

One can agree that the advice given in this leaflet for the most part is excellent. However, no convincing proof is provided as to the theory being correct, and it is interesting to note that the so-called "tooth-cleansing foods" recommended by Dr. Wallace are those rich in vitamins and incidentally are the more expensive articles of diet.

We feel that the question of the causation of dental caries is not so easy as the author would have us believe and there are more things both in heredity and environment than he has accounted for. The medical profession will profit by a perusal of this work, in spite of its defects.

### SEMEIOLOGY AND DIAGNOSIS.

THE fact that Dr. Hare's volume on diagnosis has reached its ninth edition is evidence of its appreciation by members of the medical profession.<sup>2</sup>

The author in his preface deplures the tendencies of the young physician in endeavouring to make a diagnosis, to trust rather to laboratory findings than to the results of clinical investigation. It is recognized by all physicians of experience that frequently the work of the laboratory specialist is essential for an exact diagnosis; but it is also evident that in very many instances the nature of the disease is not recognized because of want of sufficient care in clinical investigation and it is to prevent such errors and shortcomings that this book is written.

A short introduction devoted to general diagnostic considerations is followed by a series of chapters in which the author discusses the indications afforded by clinical investigation of the various organs of the body. He then reviews in detail a number of symptoms, such as fever, cough, headache, pain *et cetera*, enumerating the principal conditions which give rise to the symptoms under discussion. There are many tables stating the essential points in the differential diagnosis of similar diseases and there are also many helpful illustrations.

<sup>1</sup> "The Physiology and Oral Hygiene and Recent Research with Special Reference to Accessory Food Factors and the Incidence of Dental Caries," by J. Sim Wallace, D.Sc., M.D., L.D.S.; Second Edition; 1929. London: Baillière, Tindall and Cox. Demy 8vo., pp. 233. Price: 10s. 6d. net.

<sup>2</sup> "The Use of Symptoms in the Diagnosis of Disease," by Hobart Amory Hare, B.Sc., M.D., LL.D.; Ninth Edition, thoroughly revised; 1928. Philadelphia: Lea and Febiger, Royal 8vo., pp. 528, with illustrations. Price: \$5.50 net.

The book is well printed and the author's meaning is always clear. There may be a few instances in which his dicta may not be accorded universal approbation, but on the whole the subject matter indicates the conclusions of an experienced, shrewd, practical observer.

A perusal of the contents of the volume should be exceedingly helpful to all medical men, especially to the junior members of the profession, and should serve to emphasize the value of accurate observation of symptoms as the first step in arriving at a correct diagnosis.

### EXAMINATION OF FLUID FROM THE CHEST.

DR. S. ROODHOUSE GLOYNE has brought together in the form of a monograph a wealth of information on the clinical pathology of thoracic puncture fluids. The subject is treated in fourteen concise chapters.<sup>3</sup>

The present knowledge of the anatomy and physiology of the pleura is admirably summarized before the pathology is dealt with.

A short chapter explains simply the method of making an exploratory puncture. Then follow chapters dealing with the physical and chemical examination, cytological examination and bacteriological examination. Serological tests, the characteristics of serous fluids and empyema are dealt with as well as other pertinent subjects with a concluding chapter on autoserotherapy. At the end of each chapter a list of references to literature is given which should prove valuable to all who would study the work of others on this subject.

The book should prove of undoubted value equally to clinicians and clinical pathologists. The clinician is reminded of the value of cytological and bacteriological examinations of puncture fluids in helping to determine more exactly the nature of the abnormality existing while laboratory workers are given a clear picture of the conditions which the clinician is attempting to elucidate.

The whole subject is dealt with very concisely and only approved methods of examination are mentioned. There are one coloured plate illustrating endothelial cells in various stages of degeneration and three text figures in the form of diagrams as well as five photomicrographs. There are an index of authors and a subject index at the end of the book.

## Analytical Department.

### "SAL AURA."

A PREPARATION known as "Sal Aura," described as the "Orange Salts of Health," has been submitted to analysis by our analyst. The analyst's report is as follows.

"Sal Aura" is a white powder which effervesces when added to water. It is put up for the treatment of "constipation, rheumatism, gout, sciatica, lumbago, indigestion, blood disorders, fevers *et cetera*." An analysis shows:

Magnesium sulphate, anhydrous	23.2%
Sodium sulphate, anhydrous	12.1%
Sodium bicarbonate	28.0%
Tartaric and citric acids, approximately	24.0%

It has also a little saccharin and orange flavour.

It will be seen that "Sal Aura" is simply a variant of the "Effervescent Epsom Salt" of the British Pharmacopœia and will have practically the same effect and value as that preparation.

"Sal Aura" is an elegant preparation. The report of our analyst defines the indications for its use.

<sup>3</sup> "The Clinical Pathology of Thoracic Puncture Fluids," by S. Roodhouse Gloyne, M.D., D.P.H.; 1930. London: John Bale, Sons and Danielsson Limited. Demy 8vo., pp. 96, with illustrations. Price: 10s. 6d. net.

# The Medical Journal of Australia

SATURDAY, NOVEMBER 1, 1930.

All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given without abbreviation: Initials of author, surname of author, full title of article, name of journal, volume, full date (month, day and year), number of the first page of the article. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

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## MEDICAL REGISTRATION.

In the Education Number of this journal, published last week, reference was again made to the lack of uniformity in the conditions and qualifications necessary for medical registration throughout the Commonwealth. The subject is almost a "hardy annual" and has been discussed on many occasions in these pages. The intimation that an ordinance has been passed and will shortly come into operation for the registration of medical practitioners in the Federal Capital Territory may be taken as an indication that little hope is entertained by the Commonwealth authorities of any uniformity being reached on this matter in the near future. With the promulgation of the ordinance in the Federal Capital Territory there will be seven different legal enactments in Australia governing the registration of medical practitioners. The principal clauses of the new ordinance are published elsewhere in this issue.

Medical registration is necessary for the protection of the public. The public must be able to distinguish between a medical practitioner who has undergone a course of study at a recognized medical school and who has given evidence at examination of his knowledge of disease and of his ability to

treat patients, and a person who has not undergone such a course of study. It must be obvious that the possibility of successful impersonation is much greater while there are one Federal and six different State enactments, more particularly because a qualification looked upon as satisfactory in one area may not be so regarded in another. This is not the only disadvantage; two more may be cited. The first has to do with the unnecessary inconvenience resulting from the fact that a medical practitioner is compelled to seek fresh registration when he passes from one State to another; it is particularly irksome, for example, when a medical practitioner in Tasmania wishes to engage the services of a *locum tenens* from Victoria. The last and most important disadvantage has to do with the powers of medical boards in dealing with offences. As stated in the Education Number, there is considerable variation in the powers of the boards in this regard. These disadvantages have all been stated before and there is no need to elaborate them.

It may be taken for granted that all those who have given any serious consideration to the question, are convinced of the desirability of the establishment of uniformity throughout the Commonwealth. The Royal Commission on Health in 1925 spoke with no uncertain voice:

The Commonwealth should endeavour to arrange for the transfer to the Commonwealth from the States of their powers with regard to registration of medical practitioners.

So far no constructive suggestion other than this has been put forward. The transfer of powers of this nature from State to Commonwealth would necessitate a change in the Constitution. There is a fear that existing boards would go out of existence and on more than one occasion opposition to the proposed transfer has been expressed on these grounds. It should surely be possible to arrange matters so that the central Commonwealth board would consist of an amalgamation of portions, if not the whole, of existing State boards under the ægis of a minister of the Commonwealth Government. In fact, some such arrangement as this would be necessary. There would have to be in each State sections or subcommittees of the board or some group of persons appointed by it with the right to

investigate the claims of persons seeking registration and with the power to recommend to the whole board that registration be effected—it would be absurd to expect a medical practitioner arriving in Western Australia from Europe to go to Canberra to seek registration.

As a result of some such arrangement as that which has been roughly outlined, it would be possible to deal more effectively with offences. At the present time, even in those States in which the board has most extensive powers, it is necessary for a complainant to bring an alleged offence to the notice of the board. In certain circumstances it might appear that the Branch of the British Medical Association in that State should act as complainant. This it could not do, since most of the members of the board would be members of the Branch—the Branch could not act as complainant to a board composed of its own members. With a Commonwealth registration board in existence, a Branch of the British Medical Association might act as complainant and in these circumstances the members of the board who were members of the complainant Branch would retire from the board when it sat in its judicial capacity. It would be also a distinct advantage to an alleged offender to be tried entirely by persons belonging to other States.

These considerations and suggestions have been brought forward in an attempt to show that uniformity of regulations and conditions for registration is necessary, that it is not unobtainable and that renewed efforts should be made towards the desired goal. The matter should be brought before the next Premier's Conference and steps in that direction might be taken by the Federal Health Council.

### Current Comment.

#### THE NUTRITION OF CHILDREN AND DIET.

HEALTH enthusiasts are perpetually exhorting the public to drink more milk. Cow's milk is extolled as a perfect diet, possibly with certain modifications. But it is commonplace knowledge that raw milk as delivered to the consumer may teem with pyrogenic or other organisms, including the tubercle bacillus. Sterilized milk, on the other hand, while safe bac-

teriologically, may have its nutritive value impaired and its vitamin content sadly depleted. A critical revision of the subject is clearly indicated. Dorothy E. Lane and Florence H. Bosshardt have made some investigations on the nutrition of children on a mixed and on a vegetable diet.<sup>1</sup> They observe that in certain animals the rate of growth and the size can be influenced through the choice of foods irrespective of heredity and environment. Much has been said concerning "normal" rates of growth. Generally the "normal" has been applied merely to the rate of growth in body weight, compatible with a given height and age. Possibly over-emphasis has been placed on this phase of "normal" development. There are other factors equally important in making standards of child health, such as resistance to infection, overcoming the development of organic diseases, endurance and mentality. Calculations regarding weight, height and age may have serious limitations and other criteria are being used in evaluating "normal" development of children. The object of the investigation was to determine the effects of a combination of vegetable foods and the effects of an ordinary milk, meat, bread and vegetable diet on the health of growing children from seven to fifteen years of age.

Lane and Bosshardt give a review of the literature of the subject. They point out that in 1922 H. C. Sherman and Edith Hawley found that children from three to thirteen years old, on ordinary mixed diet containing daily 750 grammes of milk, stored 0.15 to 0.62 gramme of calcium daily. When the milk was increased calcium storage was increased. When the amount of milk was diminished and some vegetables were substituted, calcium storage fell. They concluded that "one quart (1,200 cubic centimetres) of milk per child per day is the amount required for optimum storage of calcium and presumably, therefore, for the optimum development of bones and teeth." Also "children do not utilize the calcium of vegetables as efficiently as they do that of milk." Lane and Bosshardt think that possibly the vegetables used by Sherman and Hawley were inadequate. The acid-base equilibrium of the blood may have been at fault and the ratio of mineral elements may have been displaced. The diets of Sherman and Hawley were more acid-forming than those used in the authors' experiments. Cow's milk is regarded as neutral, but in metabolism it may be slightly acid-forming because of defective absorption of base-forming elements. The authors' experimental diet was more laxative and the reaction of the intestines was probably more acid, insuring better mineral absorption. In 1923 F. Newell and E. W. Miller found that 45 cubic centimetres of orange juice added to the diet of children produced considerable gain. In 1923 M. S. Chaney reported giving orange juice instead of milk as supplementary feeding of school children. Milk and oranges taken together seemed to stimulate growth slightly better than milk or orangeade alone, but not as much as

<sup>1</sup> *American Journal of Diseases of Children*, August, 1930.

oranges alone. In 1925 M. S. Chaney and K. Blunt found that calcium, phosphorus, magnesium and nitrogen were better retained when 600 to 700 cubic centimetres of orange juice were added to the mixed milk diet containing 300 cubic centimetres of milk. Marked increase in weight was observed. In 1929 L. B. Hill and H. C. Stuart prepared a vegetable (soy bean) milk for infants when cow's milk was contraindicated. This product gave entire satisfaction. In 1929 V. B. Appleton commented on the fine physique, excellent teeth, strength and endurance of Chinese rice-eating coolies who had never tasted milk. This observation is in accordance with the experience of Australians who have practised in country districts, where milk may not be procurable. Provided there be no calcium deficiency, people may surmount dietary handicaps. The authors point out that strong, healthy teeth may be produced when diets are largely or entirely composed of vegetable foods and that dental caries can be arrested by suitable combinations of foods, regardless of the salivary reaction or oral bacteria. When suitable supplementary foods are employed with whole grain cereals, milk is not necessary for growth, reproduction and lactation. Mention is made of the experiments on rats by E. Mayer and I. N. Kugelmass, but a serious omission is that no reference whatever is made to Mrs. May Mellanby's experimental studies of the aetiology of dental caries in dogs.

The authors took twenty-six children, aged from seven to fifteen years, half being in the experimental group and half in the control group. In the control group the children had meat, eggs, potatoes, cereals, bread, a little butter, milk (1,200 cubic centimetres a day), fruits, vegetables, cocoa and often cheese. In the group submitted to experiment no milk, cream, cheese, eggs or meat was given and only the same small quantity of butter as in the control group. They had almonds for their basicity, their calcium, copper, iron and protein. Figs also were given for their basicity, calcium, iron and laxative property. Wheat germ was given for vitamin B complex, calcium, phosphorus, iron, iodine, copper and protein; orange juice for basicity, calcium and vitamins A, B and C; peanut butter for basic amino-acids; also other legumes, honey and a small amount of cane sugar. The aim in both groups was to provide 1,750 calories a day per child. The protein was calculated as providing 10% or more of the calories. The calcium intake of the experimental group was close to 0.65 gramme each daily; that of the control group (with 1,200 cubic centimetres of milk daily) averaged one gramme intake. Cod liver oil was given to six subjects of each group.

The physical appearance of all the children at the end of the feeding period (ten weeks) was improved. This improvement corresponded closely with the gain in measurements. In some cases a loss of weight resulted. Three showing a loss of weight were in the milk group without cod liver oil. The greatest gain in weight was in the milk group

with cod liver oil. One child, gaining in weight on the vegetable diet, lost weight when transferred to the milk diet. Another, showing continuous loss on the milk diet, gained in weight on being transferred to the vegetable diet. Full details of the diets and the results are carefully recorded in the paper and the authors conclude that there appears to be no reason for the conclusion that a scientifically balanced milk diet, including 900 to 1,200 cubic centimetres of milk per child per day, produces greater growth or better health in growing children from seven to fifteen years old than a scientifically chosen vegetable diet furnishing a smaller amount of calcium. If there be a greater calcium storage on the milk diet than on the vegetable diet (a supposition not justified by the gains in weight and height and other data) there would still be no reason for assuming that such excessive storage is advantageous for the general health of growing children. Excessive calcium storage may perhaps obscure a clear perception of the function of other factors in the diet, whether it be that of the calorie-producing nutrients, the various minerals and vitamins or the acid-base equilibrium of the blood.

The conclusions of Lane and Bosshardt are, of course, based on a very small series of children. They are, however, of special interest to medical practitioners in the back country districts of Australia and in the tropics. It is sometimes possible to procure vegetables when milk is unobtainable. In these circumstances fruits and vegetables, carefully selected and given either uncooked or properly prepared, should be used. There are so many other factors to be considered that it would probably be impossible to estimate the effect of diets of these types, given over long periods, on the general vitality and mentality of the children. The better nourished children are not necessarily the most alert.

#### UNSUCCESSFUL OPERATIONS ON THE NASO-PHARYNX.

THE removal of tonsils is undertaken by the majority of general practitioners. The subsequent well-being of the patient depends on the skill of the surgeon. While incomplete removal may allow the patient to experience a certain amount of relief from symptoms, a second operation is often necessary. Occasionally the result of operation is a lasting monument to the ignorance of the operator. Such a case was reported recently by N. Patterson.<sup>1</sup> The patient, aged twenty-five years, had been operated on twice in childhood for removal of tonsils and adenoids. There was much scarring in the region of the pharynx and palate and only a small opening was present between the oro-pharynx and the naso-pharynx. The surgeons who discussed the condition could reach no unanimity in regard to treatment. The deformity is admittedly extreme, but the moral of the tale is obvious.

<sup>1</sup> *Proceedings of the Royal Society of Medicine*, August, 1930.

## Abstracts from Current Medical Literature.

### RADIOLOGY.

#### Radiographic Examination of the Breast.

STAFFORD L. WARREN (*The American Journal of Roentgenology and Radium Therapy*, August, 1930) presents a simple method of studying the breast by means of stereoscopic skiagrams. He believes that this method will reveal absolutely diagnostic evidence in some instances and will be of considerable assistance in others, but it has a very definite limit in certain instances. A simple technique is fully described with the use of a Potter Bucky diaphragm. The opposite side is always examined for comparative study. In describing the interpretation of the appearances of the normal breast he states that the structures can be fairly clearly seen, the nipple standing out from the areola, the ducts, usually numbering from five to eight, extending towards the base and the base sharply separated from the pectoral muscles by a definite line or septum about one millimetre in thickness. The acini masses or lobules of the breast stand out from the fatty masses which are transparent. The pectoral muscles are seen as a layer from one to three centimetres in thickness and there is a thin septum between them and the ribs. Sometimes the pleura is identified. The author describes the normal changes due to pregnancy and discusses breast abscess. In the latter the usual picture of lactation is present with the addition of considerably more of the general haziness than is usual at this stage. A more or less clearly outlined, uniform, dense mass can be made out in all instances. In one instance the author observed two such masses, each of which yielded pus at operation. In chronic mastitis it is difficult to separate the earliest changes from the normal, and it is here that comparison with the other breast is of great value. The inflammation tends to involve the duct and lobular structures more than the fatty masses, and in the skiagrams a diffuse or localized scarring and thickening along the ducts and lobules is seen. Benign tumours of the breast are clearly demarcated from the surrounding structure; they are homogeneous in density, though they do show connective tissue stroma and a definite arrangement for various types—the whorls so characteristic of intracanalicular myxoma, for instance, can be detected. The chief characteristic of malignant tumours is the distortion of the nearby structures by scarring and puckering, and the irregular manner of infiltration by the tumour tissue. The edges are irregular, and feathery strands of dense tissue invade the ducts and lobules as well as puckering and thickening the skin. Infiltration along the lymph channels into the

axilla with enlargement of these glands can also frequently be noted. Sometimes a rapidly growing malignant tumour may cause compression of the surrounding structures, giving the appearance of a capsule, but the diagnosis is apparent from the invasion through this dense border into the surrounding tissues. The differentiation between involvement by tumour and dense inflammatory areas is the most difficult problem. Both cause scarring, both have strands of dense material invading the surrounding structures. Tumour tissue, however, is considerably denser and appears as a solid mass from which the radiation occurs. In summing up the results of the study, the author states that in the series the existence of tumour has been diagnosed in several instances when it was not suspected clinically, and operation proved that the diagnosis was correct. On the other hand, scirrhus cancer has been sometimes erroneously diagnosed as chronic mastitis. These errors are explained as due in great part to inexperience. The author states that only eight errors in 119 cases were made.

#### Subphrenic Abscess.

E. P. MCNAMEE (*The American Journal of Roentgenology and Radium Therapy*, August, 1930) describing subphrenic abscess, states that Röntgenological examination frequently gives the most precise and definite information to the clinician confronted with the problem of a pathological condition involving the structures either in the base of the thorax or the upper region of the abdomen. Complete Röntgenological examination is one of the essential aids in making the diagnosis of subphrenic abscess. The condition may follow infection in the peritoneal cavity or in any of the organs or structures in contact with the under-surface of the diaphragm; rarely it follows infection in the thorax, and more rarely still distant foci of infection. The situation may be intraperitoneal or extraperitoneal, and although the abscess is usually confined to the right or left side, and in addition is usually definitely anterior or posterior, it is nevertheless frequent for the process to spread more widely. The author describes the pathology of the lesions and in dealing with the history states that subphrenic abscesses should always be suspected in the presence of an unexplained fever, following an abdominal operation. The physical signs are described and then a description of the Röntgenological examination is given in more detail. When both fluid and gas are present the radiological signs are conclusive, but when no fluid level can be seen, the evidence must be interpreted in conjunction with the clinical symptoms. Both screen examination and films are made, in every position from the Trendelenburg to the almost vertical. The points to be noted are: The position of the mediastinal structures; the position, contour and excursion of the diaphragm; the contents of the lung space. When there are no com-

plications the mediastinal structures are not displaced. The diaphragm on the affected side is raised and more acutely arched, and although there may be slight excursion, the diaphragm is usually fixed. The lung space above is clear. When gas and fluid are present they can be detected and waves can be produced in the fluid by shaking the patient. The situation is revealed by skiagrams taken from various angles. When the condition has existed for some time, there is pleuritis with a small collection of fluid in the costo-phrenic angle. Persons suffering from subphrenic abscess are sometimes referred to the Röntgenologist with a provisional diagnosis of empyema. The abscess may be single or multiple, may occur on both sides or have several pockets on one side. A severe degree of pleuritis and pneumonitis may obscure the diagnosis. After treatment by drainage has been established, serial examinations are made weekly to study the progress of the condition, especially in regard to the position and fixation of the diaphragm. A description of the treatment and the course of the disease, and several case reports are included in the article.

#### Radiological Appearances in Erythroblastic Anæmia.

F. N. MANDEVILLE (*Radiology*, July, 1930) describes the radiological findings in erythroblastic anæmia. He states that this is a hæmolytic anæmia in infancy and early childhood, the most striking characteristic of which is the extremely large number of erythroblasts in the circulating blood. Only one subject is known to have reached adult life. A familial tendency has been observed and the disease appears to be confined to children of Mediterranean ancestry. All patients examined by Röntgen rays had changes in some of the bones. Dealing with the classification of anæmias in general, the author divides them into three groups according to whether they are due to loss of blood, or defective blood formation or are associated with increased blood destruction. Bone changes are not common in anæmias, but when they do occur they are often striking and of material aid in diagnosis. The changes in erythroblastic anæmia seem to justify its consideration as a definite clinical entity. The history of the disease is described. The Röntgen ray studies show thickening of the medullary portion of the frontal, parietal, temporal and occipital bones; thinning of the inner and outer tables; a mottled appearance of the medullary portion of the cranium; striations perpendicular to the tables of the skull in the later stages, when the diploë may attain the thickness four times its normal width; irregular trabeculations in the pelvis, vertebrae, ribs, clavicles and scapulae; definite thinning of the cortex of the long bones; rarefaction of the shafts of the long bones with increased translucency of the medulla. Trabeculations similar to those seen in the pelvis are also present in the long bones. The joints

are normal, there is no periosteal involvement and pathological fractures do not occur.

# PHYSICAL THERAPY.

## Xanthomatosis.

MERRILL C. SOSMAN (*American Journal of Roentgenology and Radium Therapy*, June, 1930) reports three cases of treatment of xanthomatosis by means of Röntgen rays. "Xanthomatosis" is the term coined by Rowland to cover a group of diseases in which the lipid metabolism is at fault. He includes the syndrome known as "defects in the membranous bones, diabetes insipidus and exophthalmos," Gaucher's disease, Pick-Niemann's disease (lipoid histiocytosis), and the various forms of xanthoma, xantho-myeloma and xanthelasma. The disease is presumably due to disordered metabolism of the fats, but its primary cause is unknown. Regulation of diet did not cause any reparative changes in the cranial defects in two of the patients. "Insulin" was similarly of no help in one instance. All three patients benefited by X ray treatment and the defects in the skull underwent healing changes in each instance. Spontaneous remissions undoubtedly occur in this disease, as Christian's original patient is alive and well in 1930, twelve years after the disease was noted, and then in an advanced stage.

## Tumours of the Tonsil.

G. ALLEN ROBINSON (*American Journal of Roentgenology and Radium Therapy*, June, 1930) reports on the use of radium in 33 malignant new growths of the tonsil; 27 patients were males and six were females. The ages ranged from 22 to 73 years. There were nine between the ages of 40 and 50, ten between 50 and 60, and two between 70 and 80 years. There were three males and three females in the sarcoma group, further classified as follows: Three lymphosarcoma, two fibrosarcoma and one perithelioma. In the epidermoid carcinoma group of 27 malignant tumours of the tonsil, one patient is well seven years, one two and a half years, two two years after commencement of treatment. Those who died, lived for an average of twelve months after the initial treatment. Except when the disease was far advanced, relief was obtained for several months and was sufficient to justify the treatment. The older technique of inserting platinum radium needles into the base of the primary lesion has been changed to the use of gold radon implants of 1.0 to 1.5 millicuries with a wall 0.2 millimetre in thickness. The use of 2.0 to 2.5 millicuries with a wall thickness of 0.3 millimetre is even more desirable. One implant irradiates approximately one cubic centimetre of tumour tissue. Interstitial radium treatment is the treatment of choice for the primary growths. External radium packs have been used in the treatment of the metastatic deposits in the neck. There

were no clinical cures among patients with palpable cervical metastatic lymph glands. Malignant tumours of the tonsil should be recognized early, but much delay may be occasioned by continued treatment for Vincent's angina, lues and chronic tonsillitis. Biopsy is indicated in all cases of ulcerated lesions which do not respond easily to local treatment.

## The Systemic Effect of Röntgen Rays.

ERNST A. POOLE AND ELMER I. SEVRINGHAUS (*The American Journal of Roentgenology and Radium Therapy*, March, 1930) state that though Röntgen rays have been used in medicine as a therapeutic agent for more than thirty years, the exact mechanism of their action on living cells is not known. In view of the systemic effect of irradiation, numerous investigations of the blood and its components have been undertaken for the purpose of demonstrating any regular changes occurring after exposure of the living organism to Röntgen rays. These studies have included both animal experimentation and clinical observations. Fourteen dogs were exposed to filtered Röntgen rays of short wave length over the anterior and posterior lower part of the body, over the posterior part alone, and over the posterior upper part of the thorax. The dose amounted to 500 Röntgen units, the surface dose to approximately 600 Röntgen units per field. Six additional dogs served as controls. The hemoglobin, the total non-protein nitrogen, the uric acid, the sodium chloride and the cholesterol in the blood were not appreciably altered in quantity by irradiation. There existed no apparent relation between dose, part of body exposed and effect. As far as the discrepancy between the findings in normal dogs and those in pathological cases in man is concerned, the authors feel that only a comparative study on healthy persons can offer an explanation.

## Ultra-Violet Burns.

ARCHIBALD P. EVANS (*Archives of Physical Therapy, X Ray, Radium*, July, 1930) describes twenty-five cases of excessive exposures to sun, quartz burners and Kromayer lamps. All the burns excepting the Kromayer reactions were self-inflicted. The apparatus for treatment consists of a high frequency generator with a spark gap control, the whole resembling the early wireless spark transmitter of one kilowatt capacity. The frequency has been raised extremely high and the faradic wave preserved and accentuated. The patient is connected to the resonator circuit and the operator applies a hard vacuum electrode which is grounded through his own body to the surfaces to be treated. The author declares that the faradic wave undoubtedly plays an important rôle in reducing the oedema by contracting the muscle fibres in the skin and blood vessels, thus preventing blood stagnation, oedema or diapedesis. Without blood stagnation and oedema

there can be no blister formation or pain due to pressure effects on the nerve endings. The dose must be carefully regulated, the guide being the patient's tolerance, each application being so brief that no sensation of burning is experienced. Great care must be taken that no arcing takes place between the skin and the electrode. Under this method of treatment the painful results of over-exposure to sun and ultra-violet rays have been overcome. The method seems to offer rapid relief from the pain and disability due to accidental over-exposure to the radiations of recognized therapeutic value.

## Sarcoma of the Prostate in Infancy.

GERARD RAAP (*American Journal of Roentgenology and Radium Therapy*, August, 1930) reports a case of sarcoma of the prostatic area in an infant aged four months. The mother had noticed that the child strained and became very red in the face during bowel evacuation. She found that instead of the baby passing faecal matter it was forcing out urine, a few drops at a time. The mother reported this to the family physician who suggested that the baby was teething and its bowels were upset. An operation was done to relieve retention. On opening the bladder, the prostatic lobes were seen to protrude into the bladder and several small pedunculated polypi were hanging through the sphincter with their attachments apparently in the posterior urethra. An examination of the posterior urethra by the little finger disclosed the fact that the tumour in the prostatic area could easily be enucleated. Believing that the only chance of saving this child's life was by removing the obstructing tissue, the operator proceeded to do a complete prostatectomy. This having been done, a search with the examining finger was made of the retrovesical space to determine if any of the tumour growth was situated in that region. It was found that the growth did not extend in this direction and the prostatic area was packed with gauze, a drainage tube placed in the bladder, and the bladder, muscle and skin closed in the usual way. Dr. James Ewing, of Cornell Medical School, reported that the cut surface of the tumour was white, glistening, soft and homogeneous. The tumour was malignant and he regarded a recurrence as not improbable. Myxosarcomata of the prostate were well known and he had seen others at this very early period of life. After fifteen days the child died. This probably represents an instance of one of the earliest occurrences of sarcoma of the prostatic area. In a discussion before operation it was felt that the alternative in diagnosis was that of polypoid growths. The advisability of irradiation was discussed, but it was thought that delay in relieving retention was not justified and in addition there was no certainty of differentiation with relation to the benign or malignant character of these masses.

## Special Articles on Diagnosis.

(Contributed by Request.)

### XVII.

#### TABES DORSALIS.

THE modern treatment of neuro-syphilis affords many examples of arrested progress of tabes, even in its moderately advanced stages. Early diagnosis and treatment of tabes should result in a better prognosis than has hitherto been given to this disease.

Although years elapse between the time of primary infection and the production of tabetic manifestations, it is often found that on going over the history of the case symptoms have been present during a great portion of the time. These symptoms may have been so mild and ephemeral that medical advice was not sought. On the other hand, as objective findings may be negligible and as at this stage symptomatic treatment may temporarily alleviate the symptoms, the true nature of the aetiology of such symptoms may pass unrecognized by competent observers.

It should, however, often be possible to suspect a tabetic condition from the patient's own description of his symptoms before definite objective signs become established.

A brief review of the pathological conceptions of tabes will give an insight into its clinical manifestations.

Hughlings Jackson realized that locomotor ataxia could occur without ataxia, and gave the name *tabes dorsalis* to the disease. Earlier observers had already described posterior column and posterior root degeneration. This process was thought to commence within the spinal cord.

Towards the end of last century Oberstienner and Redlich put forward the theory that degeneration commenced in the posterior root outside the cord itself. They considered that a meningeal involvement took place at the point where the posterior roots pass through the *pia mater*. Since then controversy has raged as to where exactly the syphilitic virus commences its degenerative inflammatory process. Nageotte considers the primary lesion of the posterior root itself, taking place in close proximity to be a radiculitis—an interstitial inflammatory process to the posterior root ganglion. Row and Orrs, on the other hand, considered that toxins are carried by perineural lymphatics from a peripheral focus to the posterior root, attacking the posterior root immediately it pierces the *pia mater*, where it loses its sheath of Schwann.

More recently Richter considered that spirochaetes were taken by the cerebro-spinal fluid to the radicular portion of the posterior root, where a syphilitic granuloma is formed; this eventually compresses the posterior root, causing degeneration along its course. As recently as last year Ruby O. Stern produced evidence to show that in all probability the toxins are carried along the perineural lymphatics to the posterior root from syphilitic virus situated altogether outside the central nervous system.

It is suggested that, as it is known that spirochaetes may live for many years in the aorta, the aorta may be the process from which the toxic infection arises.

The division of tabes into a preataxic stage, in which subjective phenomena are the predominant features, an ataxic stage, and a terminal stage, is useful only in a limited number of cases. A broader view of the diversity of the symptoms may be gained by classifying tabes into:

1. Spinal tabes, in which root pains, crises, bladder symptoms and ataxia are the prominent features.
2. Ocular tabes, with early and often rapidly progressing optic atrophy, spinal symptoms remaining in abeyance during the greater part of its course. Loss of visual acuity is the first symptom and this may go into complete blindness within eighteen months.
3. Tabes accompanied by meningo-vascular syphilitic changes, such as thromboses, epileptiform seizures; or by toxic cellular degeneration, as is seen when cranial nerve palsies or the progressive muscular atrophy type of spinal lesion accompany tabes.

4. Tabes accompanied by psychotic phenomena, either as a tabo-paresis or as part of a delusional condition, which is occasionally present as a psychological rationalization for the pain.

Pupil changes often accompanied by ptosis are common to all forms of tabes. The Argyll Robertson pupil is said to be pathognomonic of cerebro-spinal syphilis, although *encephalitis lethargica* sequelae sometimes produce fixed and unequal pupils. The loss of light and accommodation reactions are equally affected in this condition. Cerebral arteriosclerosis, the effects of certain drugs, may give rise to pupil changes suggestive of tabes or tabo-paresis and, indeed, there may be some difficulty in establishing a diagnosis without continued observation and serological tests. Irregularity in outline or oval-shaped pupils may be one of the earliest objective findings in tabes and should always call for application of the Wassermann test and complete cerebro-spinal examination.

From the anatomical position of the spinal lesion in tabes it is obvious that sensory and affective phenomena must be an outstanding feature in its clinical manifestations. Such phenomena naturally fall into two groups, namely, subjective symptoms and objective signs. Either of these may be found as an early manifestation of tabes and their elicitation at this stage may merely be a matter of careful clinical observation.

Pain is the most common subjective sensory symptom of tabes and makes its appearance early in the course of the disease. The typical lightning pains present little difficulty in diagnosis; the patient's own vivid description of the instantaneous, knife-like boring or tearing quality of the pain is sufficient in itself to make a diagnosis of tabes a probable one.

A great many of the early painful symptoms of tabes are, however, far from being clear cut. Such symptoms may persist for years unrecognized until the disease becomes more established and more resistive to treatment. Pupil changes, alteration in the tendon reflexes and objective changes generally, although they may appear years before tabes becomes well advanced, must be considered as signs of a permanent establishment of the disease.

The milder painful symptoms that precede these more diagnostic signs, may simulate other conditions and are worthy of closer consideration.

Painful sensations may occur in any part of the trunk or limbs. Occurring in the big toe, they may be mistaken for the pains of gout. Pains may occur in the upper thoracic region and radiate down the arm, and may be thought to be anginal in origin. Pains in the back of the thighs, thought to be due to sciatica, are often tabetic in origin. A less acute type of tabetic pain is sometimes labelled "rheumatism" or "myalgia" or may be considered to be psychogenic in origin.

It will be found that in tabes the part to which the pain is referred, is invariably hyperæsthetic to superficial touch. Close examination may reveal areas of loss of tactile and painful sensibility.

Paræsthesia of the soles of the feet may appear early and may be accompanied by only a mild degree of ataxia. Ataxia itself as a subjective symptom is first noticed by the patient when he is walking in the dark; the classical example of such a symptom is the patient who suddenly falls down whilst washing his face at a hand basin. A diagnosis may have to be made at this stage from toxic peripheral neuritis or subacute combined degeneration or from disseminated sclerosis in which posterior column loss is sometimes found.

The pains of tabetic gastric crises are commonly mistaken for those of an acute abdominal condition. In the former the abdominal pain, though exceedingly severe while it lasts, may disappear with comparative suddenness, the patient then being able in many cases to take an ordinary meal in comfort. Distension and local tenderness are not found in tabetic crises, although there are marked general tenderness and hyperæsthesia over the whole abdomen during the paroxysm of pain. Furthermore, the abdomen is not held in a position of rigid immobility in tabes, as is found in an acute abdominal condition.

The objective sensory findings are well enough known to need only a brief outlining. Mott considered trunk anaesthesia to light touch to be the earliest constant sign of tabes. In the preanaesthetic stage a zone of hyperaesthesia may make its appearance, thus presenting a picture similar to that of an early spinal tumour or myelitis. This hyperaesthetic zone may later become an area of anaesthesia. Gordon Holmes mentions the butterfly-shaped area of anaesthesia across the bridge of the nose to be an early sign in his experience.

Other early objective changes are seen in loss of sensation over the ulnar nerve, loss of testicular sensation which is associated with impotence and may be preceded by increased sexual desire. As regards ataxia from the objective standpoint, Romberg's sign is present at an early stage of the development of ataxia. It may only manifest itself in a slight swaying which, however, tends to increase if the patient has no fixed object to grasp. The grosser forms of ataxia are not altogether dependent upon loss of deep muscle and joint sensibility, but are due in part to muscular hypotonia resulting from interference with the afferent fibres from the limbs. When testing for joint sense of position of the big toe, the earliest indication of such loss is shown by a voluntary tension that the patient puts on his toe, as though he were trying to feel whether he could flex or extend the toe more easily. This tension can be easily felt by the observer and should arouse suspicion of some loss of joint sense, even though the patient gives the correct position of his toe.

Bladder symptoms are sometimes the earliest indications of tabes and may commence with mild difficulties in micturition. A slight involuntary urination may occur when the intraabdominal pressure is increased, such as happens when the patient coughs or laughs spasmodically. There is often deficient emptying of the bladder which may lead to the residual urine becoming infected with subsequent bladder or kidney infection.

A patient may present himself for examination with a swollen joint and a history of pain which may appear to be associated with the joint, giving the appearances found in acute rheumatism or acute rheumatoid arthritis. Closer examination may reveal the fact that the pain is in the limb and not associated with the joint. Tabetic arthropathies sometimes occur in this way as the earliest manifestations of tabes. Close inquiry as to the duration and nature of these pains may show that they are tabetic lightning pains.

Tabes is often accompanied by meningo-vascular syphilitic changes and, indeed, epileptiform seizures, hemipareses or hemianesthesias, strabismus or some other cranial nerve involvement may be the first indication of any disease. Further examination may reveal absent tendon jerks, Argyll Robertson pupils and other recognizable signs of tabes.

Tabes may be complicated by parenchymatous cellular degeneration, not only in cerebral cortex as in taboparesis, but in the anterior horn cells of the spinal cord. Thus a condition of progressive muscular atrophy is often syphilitic in origin and may be accompanied by tabetic manifestations. The first indication of any pathological condition present would be weakness of the hand and arm, with some degree of wasting of the small muscles of the thenar and hypothenar eminences.

Kinnier Wilson has described cases of tabes in which tremor of the hands, not unlike an early Parkinsonian tremor, appears early in the course of the disease. This he ascribes to a rubro-spinal involvement.

Serological reactions of the blood or cerebro-spinal fluid will clinch a doubtful diagnosis in 80% to 90% of cases. An increase of mononuclear cells, an increase of globulin or a luetic Lange gold curve on examination of the cerebro-spinal fluid is almost universally found in untreated patients. There are a few cases of undoubted clinical tabes in which all blood and cerebro-spinal findings are normal.

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## British Medical Association News.

### SCIENTIFIC.

A MEETING OF THE NEW SOUTH WALES BRANCH OF THE BRITISH MEDICAL ASSOCIATION was held in the Robert H. Todd Assembly Hall, British Medical Association House, 135, Macquarie Street, Sydney, on September 25, 1930, DR. E. M. HUMPHREY, the President, in the chair.

#### Physiology of the Gall Bladder.

A motion picture showing the contraction of the gall bladder in the dog was demonstrated by a representative of Petrolagar Laboratories Incorporated. The film had been prepared at the Northwestern University, United States of America. It was based on work done by Ivy, who held that a hormone mechanism is concerned in gall bladder contraction and evacuation. It was explained that Ivy, with his collaborators, had obtained a secretin especially purified. He had found that the extract of the upper intestinal mucosa, when properly prepared, caused the gall bladder to contract. The pressure in the gall bladder rose as a result of a single injection and increased from a series of injections. This rise was not due to extrinsic influences such as respiration, abdominal movements or change in liver volume. The contraction of the gall bladder was abolished by deep anaesthesia and low blood pressure. The active principle acted after atropine and ergotamine had been given and this indicated that it acted directly on smooth muscle. It was neither histamine nor choline. It was not related to bile or bile salts. It was not identical with the ordinary known secretin, but was closely associated with it. Ivy had called this active principle "cholecystokinin." In the course of the film the injection of this active principle into the gall bladder was depicted and the contractions were evident. The preparation of a graphic record of the increase in pressure in the gall bladder was shown.

#### Preoperative Preparation of Jaundiced Patients.

DR. W. J. STEWART MCKAY read a paper entitled: "The Preoperative Preparation of Patients with Jaundice due to Gall Bladder Disease" (see page 591).

DR. V. M. COPPLESON thanked Dr. McKay for his paper and said that they all regarded the subject as one of great difficulty. He had often been at his wits' end to know what to do for the patient. One could never tell with confidence what the outcome of an operation on a jaundiced patient was likely to be; with other conditions it was reasonably possible, but not with this. In regard to the similarity of this condition and renal back pressure, he wondered whether it could be due to the sudden release of pressure with associated cholangitis. Whilst it had been stated that the change in the patient was often most pronounced on the eighth day from the time of operation, the patient did not seem to pick up. The bowels acted, but the patient went down hill without any apparent cause, being shocked and remaining shocked. Dr. Coppleson wondered whether thrombosis had anything to do with the change. He asked Dr. McKay whether "Coagulin Ciba" would be likely to cause coagulation in the veins. But little was known about the blood flow in the portal vein and it had been suggested that coagulation in the portal circulation might be responsible. A somewhat similar clinical condition was sometimes seen when no jaundice was present, after operation on empyema of the gall bladder.

DR. T. W. LIPSCOMB said that he had been on the staff of Lewisham Hospital for over twenty years and he could pay tribute to the keenness shown by Dr. McKay as senior surgeon. He was present and presided at every staff meeting; he always brought up something that was helpful and acted as a stimulus.

Dr. Lipscomb thought that jaundiced patients were very sick people and that every means of preoperative investigation and preparation should be carried out before any operation was done. Dr. Flynn had reminded him of one thing in his comparison of the preliminary treatment of gall bladder patients with that used before operations on

the prostate. Walters had shown that when the gall bladder was to be joined to the duodenum, a one-stage operation often ended fatally, but that when the operation was done in two stages the results were much better. This could be done by making a small incision, inserting a self-retaining catheter into the gall bladder and allowing it to drain for eight to ten days.

DR. ARCHIE ASPINALL said that it was a privilege for them to hear a senior man give them the results of his experience as Dr. McKay had done. He thought that they owed a good deal to their senior colleagues for the interest which they took in the clinical meetings at the larger hospitals. At Sydney Hospital senior men such as Dr. Ralph Worrall and Dr. Cyril Corlette attended regularly, whilst many of the younger men did not.

He recalled a female patient, aged thirty years, who had been deeply jaundiced for six weeks and had vomited blood on a previous occasion. A skiagram taken at another hospital two years before had revealed signs suggestive of early malignant disease of the stomach. He had delayed operation for two weeks, hoping that the patient's condition would improve. He regretted that he had not used the duodenal tube. At operation the gall bladder had not been very distended, but the common duct was so distended that it had looked like the *vena cava*. He had aspirated and then opened the common duct and had passed a Hegar's dilator. As he was not sure that its point had entered the duodenum, although no stone was felt, he had incised the latter and had found a stone jammed in the lower end of the common duct. He had drained the gall bladder and the patient had died five days later after an apparently good recovery from the operation. If greater attention had been paid to pre-operative treatment, especially with the duodenal tube, the result might possibly have been different. Dr. Aspinall also referred to a somewhat similar case in which the patient had been jaundiced, the hepatic duct had been found dilated, there had been a stone in the common duct and in the liver there had been an abscess cavity filled with bile mud.

In regard to statistics quoted by Dr. McKay, Dr. Aspinall wondered that the results were so good, the mortality being in the neighbourhood of 2% or 3%; he thought that if the records of Australian public hospitals were investigated, it would be found that the mortality was higher. He was of the opinion that patients with lesions of the gall bladder were often operated on too soon after admission to hospital. Although such a course would not be popular with medical superintendents, who naturally wished to clear the beds in the surgical wards, these patients should be kept under observation until adequate preparation had been carried out.

DR. JOHN STOREY said that the danger from hæmorrhage *per se* was not so great as they were asked by the literature to believe. He had seen severe hæmorrhage in jaundiced and in unjaundiced patients. Something more than the jaundice itself was necessary. He had had this borne home to him by a patient, a young girl, in whom he had opened an appendiceal abscess. He had merely inserted a drainage tube, he had conducted no intraperitoneal manipulations at all. At *post mortem* examination the peritoneal cavity and the retro-peritoneal tissues had contained much blood clot. On further inquiry he had discovered that both the patient and her sister had previously had severe hæmorrhage after tonsillectomy. He was interested to hear of the value of "Coagulin Ciba." This drug was surely very wonderful if Dr. McKay had been able to perform cholecystostomy without tying a single vessel. It was important to consider the amount of surgical interference which was justified in any case. Cholecystectomy was fashionable, but it was often wiser to clear the common duct and drain the gall bladder and it was equally important, when obstruction of the common duct was found, to see that the duct was dilated with bougies.

In regard to hæmorrhage, Dr. Storey pointed out that on one occasion he had deliberately incised the portal vein. The hæmorrhage had been well controlled by a muscle graft. The graft had taken immediately and the patient had been safe from further hæmorrhage. In conclusion Dr. Storey referred to the use of the duodenal tube and

asked how one could be sure when the tube had reached the duodenum.

DR. H. J. DALY described the method of using the duodenal tube. He used the Lyon's tube which was marked at points indicating distance from the incisor teeth to the stomach, and also the distance from the incisor teeth to the duodenum which was about 45 centimetres. The patient usually swallowed the tube without difficulty. The tube was allowed to remain in position for an hour and a half, by which time it would be found that the bulb had passed into the duodenum. If half a glass of water containing two teaspoonsful of *acidum hydrochloricum dilutum* and some sweetening agent, such as *potus imperialis*, were given before the tube was passed, the pylorus appeared to open earlier and the tube to pass more freely. The indication that the tube was in the duodenum was the ability to draw off bile which showed an alkaline reaction to litmus paper.

The duodenal tube was a valuable method of introducing large quantities of fluid; up to as much as one gallon could be given by this method to dehydrated patients.

DR. E. M. HUMPHERY thanked Dr. McKay for his paper and said that it had been most interesting. It was attention to detail that counted most in the recovery of patients suffering from liver conditions. If obstruction were allowed to continue for a sufficiently long time, it would always lead to tissue destruction. Therefore, if it was possible to give the organ concerned a rest by draining it, this should be done.

Dr. McKay in his reply thanked the speakers for their kind remarks and said that if they wished to make progress they must all learn more of their subject. The advance that had been made was due to the influence of the study of biochemistry.

In regard to the duodenal tube and its uses, it was necessary to remember the course taken by the duodenum. The lower curve between the second and third parts of the duodenum was like a sink and it was here that the hormone postulated by Ivy was supposed to be formed. The curving downwards of the first part of the jejunum allowed the fluid introduced by the duodenal tube to get away quickly. It was on this account that the jejunum was always found empty both in skiagrams after opaque meals and at *post mortem* examinations.

As far as "Coagulin Ciba" was concerned, he had not referred to its use until he had used it for a period of two years. It could be used for hæmorrhage in many parts of the body and he referred to a case in which it had been the means of checking uterine hæmorrhage in a patient who was prone to miscarriages. He had also found that it would check the hæmorrhage after the separation of a slough of the *cervix uteri* resulting from the application of a 50% solution of chloride of zinc. He sometimes used a zinc solution of this strength in inoperable malignant disease.

## Medical Societies.

### THE BRISBANE HOSPITAL CLINICAL SOCIETY.

A MEETING OF THE BRISBANE HOSPITAL CLINICAL SOCIETY was held at the Brisbane Hospital on April 10, 1930, DR. E. S. MEYERS in the chair.

#### Carcinoma of the Ovaries and Leather Bottle Stomach.

DR. A. G. ANDERSON showed a female patient, aged thirty-eight years, who had been admitted on February 6, 1929, for X ray investigation. The history was that six months previously she had had pain under the lower part of the sternum at varying times, settling finally in the epigastric region and becoming more frequent. The pain had no definite relation to food. During the last two weeks before admission she had had severe attacks of vomiting after food. No blood was present in the vomitus. She had been slightly yellow about four times in the last two years. The bowel action was always regular. On X ray examination a large extrinsic filling defect of the stomach was found; the mass was well defined except at the upper border. The patient was discharged.

On April 2, 1929, she was readmitted, stating that for the past two months she had noticed a painless swelling in the epigastrium and a constant feeling of fullness. She had lost 18.9 kilograms (three stone) weight in eighteen months. She now suffered from constipation.

On examination a deep-seated, painless tumour was felt lying horizontally and occupying the epigastrium. A diagnosis of leather bottle stomach was made and the patient was shown at a clinical meeting of the Brisbane Hospital on April 6, 1929.

Laparotomy performed six days later revealed a typical leather bottle stomach. A portion of the gastro-colic omentum, which was very friable, was removed, close to the greater curvature of the stomach, and the condition was considered inoperable. The pathological report was to the effect that there was no sign of malignant disease in the specimen submitted and only slight inflammatory change.

The patient was discharged on April 30, 1929, and readmitted on October 23 complaining of a swelling which had existed for the past three months in the lower part of the abdomen and had grown rapidly during the past four weeks.

At the patient's request the abdomen was opened on October 25, 1929. Free fluid was found within the abdomen, two large ovarian tumours, malignant in type, were removed and were exhibited at the present meeting. The leather bottle stomach was in much the same condition as six months previously. Minute secondary nodules were seen scattered throughout the mesentery, omentum and parietal peritoneum. The appendix was found to be involved in a carcinomatous change and was removed for pathological report. This report stated that in both ovaries there was a diffuse spheroidal-celled carcinomatous change. The lymphoid follicles of the appendix had been invaded by small alveoli of rather flattened spheroidal cells derived from the mucosa. Very occasionally there appeared to be an attempt at tubular arrangement. There was no evidence of proliferation and the condition was rather quiescent.

The patient was last seen on April 1, 1930, when she had complained that since operation in October, 1929, she had had attacks of indigestion, consisting of a burning feeling on taking food and relieved by vomiting. Her appetite was not now so good. At times she felt very weak, but still did her own housework. The mass in the epigastrium was still palpable and had increased in size.

Dr. Anderson said that the leather bottle stomach was an obscure condition to which a variety of names had been given. It had been first recognized by Broun in the year 1854 and described by him as *linitis plastica*. The exact pathology of this condition had puzzled investigators ever since. Many of these leather bottle stomachs were no doubt due to very diffuse scirrhous cancers which had started in a cancerous focus in the mucous membrane, perhaps an ulcer which had become malignant, and later permeated the connective tissue planes of the stomach. A good example of the leather bottle stomach, as seen in this instance, had certain definite characteristics, namely, the shrunken lining of the stomach, tube-like in character, the enormously thickened walls, 25 millimetres (one inch) in thickness, the sudden termination of the infiltration at the pylorus so that the pyloric ring, when palpated through the duodenal wall, felt exactly like a *cervix uteri*, and the gradual fading away of the infiltration as the growth advanced towards the cardia, where the stomach wall may appear normal.

The microscopical picture was one of dense fibrosis (Boyd). In this dense fibrous tissue a few small, densely staining, carcinomatous cells might be found, but often all trace of these had vanished, and it might be on this account that some of these leather bottle stomachs were described as inflammatory or syphilitic in nature.

An important feature of gastro-intestinal cancer was its proneness to permeate the musculo-serous coat of the stomach and to invade the peritoneal cavity (Moynihan), to settle in the ovaries, tubes or uterus.

If one accepted this theory of peritoneal shower of cancer cells, one could not ask for a prettier example, as

here were these large specimens of secondary carcinoma of both ovaries and in addition the thin, finely studded peritoneal lining.

#### Adenocarcinoma of the Colon.

Dr. E. S. MEYERS showed a patient, aged forty-five years, who had been admitted on December 17, 1929, complaining of constipation, the presence of blood-stained mucus in the stools on one occasion, flatus, a feeling of tightness all over the abdomen, anorexia and the loss of 9.45 kilograms (twenty-one pounds) weight during the previous seven weeks. There was general distension of the abdomen; examination *per rectum* revealed no abnormality; the blood did not react to the Wassermann test. There were 4,400,000 red blood cells per cubic millimetre of blood. The percentage of polymorphonuclear cells was 50 and of lymphocytes 45. Röntgenological examination revealed the existence of a large caecum and ascending colon; the barium enema was obstructed at the splenic flexure of the colon. Caecostomy and appendicectomy were performed on December 27, 1929. On January 8, 1930, a portion of the colon affected with carcinoma was resected and an end-to-end anastomosis was performed. Histologically the tumour was a Broder's type 2 adenocarcinoma of relatively low malignancy. On February 12, 1930, an operation was performed for the relief of empyema.

Dr. Meyers's second patient was aged thirty-two years and had been admitted to hospital on January 15, 1930, complaining of pain which had commenced in the lumbar region and radiated to the hypogastrium. The patient had suffered from diarrhoea twelve months previously and had passed blood in the stools at that time, but for the past two months had been attending the out-patient department for the relief of constipation. During the four days immediately prior to admission no stools had been passed. There had been a loss of 1.80 or 2.25 kilograms (four or five pounds) weight recently. There was a frequent desire to micturate. There was some rigidity of the abdomen. The prostate was slightly enlarged, hard and tender. The blood did not react to the Wassermann test. Microscopical examination of the urine revealed no abnormality. Radiologically it was observed on January 24, 1930, that a barium enema did not pass beyond the recto-sigmoidal junction. On January 25, 1930, a ring carcinoma at the junction of the descending and the sigmoid colon was found and the affected portion of bowel was resected. Histologically the tumour proved to be an adenocarcinoma of Broder's types 3 and 4.

#### Ulcer of the Leg.

Dr. Meyers also showed two patients suffering from ulcer of the leg. In one instance the ulcer had been present for fifteen years. Corlette's operation had been done and a skin graft had been performed. This patient's ulcer had healed entirely and she was now up and about.

In the second case Corlette's operation had been done with excellent results.

#### Bronchiectasis.

Dr. ALEX MURPHY showed a married male patient, aged thirty-six years. The patient had been admitted on February 3, 1930. At the time of admission he complained of pain in the chest, cough day and night accompanied by copious expectoration for a period of nine years. The sputum was offensive in the morning. He had coughed about a cupful of blood on the day prior to admission. In the year 1916 he had suffered an attack of influenza and in the year 1918 he had been gassed with phosgene and had been evacuated and returned to Australia. In 1919 his health had been good, but he had suffered from breathlessness on exertion. He had had his first hemoptysis in the year 1920. Later the cough had become so persistent as to keep him awake at night and his health was indifferent. In the year 1922 he had tried work on a banana plantation, but suffered from pain in the chest, cough and dyspnoea and had had to give up. He had been admitted to Rosemount Hospital where an X ray diagnosis of active tuberculosis of the base of the right lung had been made. He had then been sent to a sanatorium at Stanthorpe. At this time he had had a cough with copious expectoration, which at times had been blood-stained.

During the next six years he had spent a great deal of time in sanatoria and had come to Brisbane in the year 1928. He had been admitted to hospital on several occasions since then. During these years his sputum had been examined on numerous occasions, but tubercle bacilli had never been observed.

He was a well nourished man whose conjunctivæ were a good colour. There was no history of nasal discharge or of frequent colds in the head. The chest moved evenly and well. The breath sounds were harsh vesicular with râles at the right base and increased vocal resonance at the same area. A note was made that the chest condition was more suggestive of pulmonary fibrosis with bronchiectasis than of pulmonary tuberculosis. The heart sounds were clear and nothing abnormal was detected in other systems. About 900 cubic centimetres (30 fluid ounces) of sputum were voided during each period of twenty-four hours. No abnormal lung markings were observed on radiological examination. However, some fibrosis was evident at the right base and "Lipiodol" was injected and a further X ray photograph taken. Careful inspection of this film revealed large cavities at the right base with two or three small ones at the left base.

Röntgenological examination of the sinuses revealed no abnormality. Artificial pneumothorax was instituted. For a period of about twelve hours after each fill there was a great increase in the amount of sputum which was expelled very easily. Some adhesions were present, but they gave way with the exception of one at the base, which prevented absolute collapse of that area.

The patient already felt much better. He stated that his cough was almost negligible, and his sputum was less than thirty cubic centimetres during each period of twenty-four hours.

## Medical Practice.

### MEDICAL REGISTRATION IN THE FEDERAL CAPITAL TERRITORY.

An ordinance has been framed to provide for the registration of persons engaged in medical practice in the Territory for the seat of Government and will come into force on November 1, 1930.

The Ordinance is cited as the *Medical Practitioners Registration Ordinance 1930*. The ordinance will be administered by a Medical Board. The Board will consist of the Director-General of Health who will be chairman, and not less than two nor more than five members who shall be appointed by the Governor-General. It is required that the members of the Board shall have been registered as medical practitioners in a State or Territory of the Commonwealth for not less than five years.

The clauses of the Ordinance dealing with qualifications for registration and cancellation of registration are as follow.

21. Any person who (a) is of good fame and character; (b) is the holder of a degree in medicine or surgery of any University in the Commonwealth or the Dominion of New Zealand, which is legally authorized to grant such degree; or (c) is registered or possesses a qualification entitling him to be registered under the Medical Acts of the Parliament of the United Kingdom or any Act amending or substituted for those Acts or any of them, shall be entitled to apply to the Board for registration as a medical practitioner.

22. When any person has applied to be registered and has proved to the satisfaction of the Board (a) that he was registered at the commencement of this Ordinance under the law in force in any State or Territory of the Commonwealth; or (b) that he is entitled to apply for registration by virtue of compliance with the requirements specified in the last preceding section; and (c) that the testimonial, diploma, licence or certificate testifying to his qualification was, after examination, duly obtained by him from a university, college, or other body recognized in

the country to which such university, college, or other body belongs; and in the period during which he has held the certificate he has not been removed from the register of any country for any cause which disqualifies him from being registered under this Ordinance; and has not been removed from the register of persons entitled to practise medicine in the United Kingdom in pursuance of the Medical Acts of the Parliament of the United Kingdom or any Act amending or substituted for those Acts or any of them; and (d) that he has passed through a regular course of medical and surgical study of not less than five years' duration, the Board may cause the person to be registered by entering in the Register his name and such other particulars as are prescribed; and issue to him, upon payment of the prescribed fee, a certificate in the prescribed form:

Provided that the Board shall refuse to register any person holding a qualification entitling him to practise in any country not being part of the British Empire where such qualification was granted unless it appears to the Board that registered legally qualified medical practitioners of any State or Territory of the Commonwealth are by virtue of being so registered and without further examination entitled to practise their profession in such country either on registration or otherwise.

30.—(1.) The Board shall remove from the Register the name of any person (a) whose registration has been obtained by fraud or misrepresentation; (b) whose qualification has been withdrawn or cancelled by the university, college or other body by which it was conferred or by the General Council of Medical Education and Registration of the United Kingdom; (c) who has been convicted in any part of His Majesty's Dominions or elsewhere of an indictable offence or of any other offence which, in the opinion of the Board, renders him unfit to practise; (d) who has been certified insane; or (e) who is deemed by the Board guilty of (i) habitual drunkenness or habitual addiction to any drug; (ii) unprofessional conduct; or (iii) any such other offence as is prescribed.

(2.) If the Board removes the name of any person from the Register, it shall, if so required by him, state in writing the reason for the removal.

(3.) Any person whose name has been removed from the Register in pursuance of this section may appeal to the High Court of Australia to have his name restored to the Register and the Board shall, if the High Court so orders, restore his name accordingly.

(4.) Any appeal under this section shall be heard by the High Court constituted by a single Justice.

(5.) In this section "unprofessional conduct" includes: (a) The practice of advertising with a view to procuring patients or practice or of sanctioning or of being associated with or employed by those who sanction such advertisement; (b) the practice of canvassing or employing an agent or canvasser for the purpose of procuring patients or practice or of sanctioning or of being associated with or being employed by one who sanctions such employment; or (c) such other matters as are prescribed.

31.—(1.) Before removing from the Register the name of any person, the Board shall make due inquiry and the person may be represented by counsel, attorney or agent, who may examine witnesses and address the Board on his behalf.

(2.) Pending the hearing of a charge against any person, the Board may suspend the registration of that person who shall thereupon cease to practise.

Attention is directed particularly to the following clauses containing provisions not included in the Acts in force in the States.

34.—(1.) A person other than a registered medical practitioner shall not (a) give or perform, for fee or reward, any medical or surgical service, attendance, operation or advice; (b) advertise or hold himself out as being, or in any manner pretend to be, or take or use the name or title (alone or in conjunction with any other title, word or letter) of a physician, doctor

of medicine, licentiate in medicine or surgery, master in surgery, bachelor of medicine or surgery, doctor, surgeon, medical qualified or registered practitioner, apothecary, accoucheur, or any other medical or surgical name or title; or (c) advertise or hold himself out, directly or indirectly by any name, word, letter, title or designation, whether expressed in words, or by letters, or partly in one and partly in the other (either alone or in conjunction with any other word or words, or by any other means whatsoever) as being entitled or qualified, able or willing to practise medicine or surgery, in any one or more or all of its branches, or to give or perform any medical or surgical service, attendance, operation or advice.

(2.) Any person, who for himself or as assistant, servant, agent or manager, does or permits any act, matter, or thing contrary to this section or any part thereof, shall be guilty of an offence.

Penalty: One hundred pounds.

39. Nothing in this Part shall prejudice or affect (a) the giving or performance, in any case of emergency, of any medical or surgical service, attendance, operation or advice by a medical practitioner duly registered under the law in force in any State or Territory of the Commonwealth; or (b) the lawful business or occupation of a dentist, pharmaceutical chemist or druggist, nurse, midwife, or masseur.

## Special Correspondence.

### LONDON LETTER.

BY OUR SPECIAL CORRESPONDENT.

#### Bethlem Royal Hospital.

BETHLEM Royal Hospital, which derived its name from the Basilica of the Nativity built in Bethlehem, Palestine, by the Emperor Constantine, was founded in 1247, and at that time was situated in Bishopsgate Without (London)—a country site beyond or "without" the old London Wall. Part of this site is now occupied by the Broad Street Station of the Great Eastern and Metropolitan Railway Companies and lies many miles within the present boundaries of Greater London. The year 1377 is the earliest date at which there is proof of the building being used as an asylum, and since that time it has always been associated with the treatment of mental illness. That the hospital experienced many vicissitudes is apparent from the detailed records in existence from which the following incidents are taken at random.

In 1367 the mayor and aldermen of London begged the Bishop of "Bedlem," then resident in France, not to "farm-out" the hospital to the highest bidder—apparently quite a usual practice in those days. Nearly forty years later Henry IV issued a commission to investigate charges of mismanagement of the hospital, and within thirty years another commission was set up to inquire into abuses. Other inquiries for similar purposes were made in 1632-1633, 1815-1816 and 1851.

In 1529 a brother of the ill-fated Queen Anne Boleyn was appointed Master of the hospital. In 1547 Henry VIII, only seventeen days before his death, ratified the deed of covenant whereby he granted the "mayor, commonalty, and citizens and their successors" to be "masters, rulers and governors of the hospital, or house, called Bethlem." In the year Queen Mary came to the English throne Bridewell Hospital was incorporated by letters patent and four years later Bethlem was placed under the same management. In 1609 it is recorded that the keeper is to be paid sevenpence per patient per week, instead of sixpence, "on account of the dearness of the times," and in 1666 the great fire of London which destroyed Bridewell Hospital,

spared the buildings of Bethlem. In 1675, nearly five hundred years after its foundation, the hospital made its first move to new buildings erected in Moorfields, and in 1693 a nurse was hired "as an experiment"! The hospital was immortalized in 1732 by Hogarth in "Bedlam," the eighth scene of his "Rake's Progress." In 1815 the second move was made, from Moorfields to Saint George's Fields, Southwark, and there has the hospital remained until the present year. The new buildings at Eden Park, some twelve miles from Charing Cross, have just been formally opened by Her Majesty the Queen, and the modern buildings, with their up-to-date equipment, form an amazing contrast to the original institution. Besides the normal accommodation for patients and staff, there is a fine chapel, a recreation hall, accommodation for hydrotherapy, massage, dental and electrical treatment, X ray therapy and psychotherapy, together with well-equipped research laboratories, a library and museum. A school of research has been established which should prove of great benefit. For many years the hospital has specialized in giving instruction suitable for candidates for the Diploma of Psychological Medicine, and the opportunities now provided for study and research should be the best in the world.

#### Beit Memorial Fellowships.

The annual report of the Trustees of the Beit Memorial Fellowships for Medical Research has just been issued and makes interesting reading. The Fellowships were founded in 1909 and were primarily to enable men who had no independent means to turn aside from ordinary medical practice and devote themselves to research work. Two hundred and thirty thousand pounds was the amount so generously given by Sir Otto Beit for this purpose, and it is of special interest to note that throughout the twenty years of the existence of this fund not one penny has been spent upon the erection of buildings. The whole of the annual income has been expended in the endowment of medical men and women for the purpose of research work, and within three years of the formation of the trust some thirty Fellows were engaged in medical research. A copy of the Book of Regulations is sent to every inquirer, giving the name and nature of the research of every holder of a fellowship since the foundation of the trust, so that the intending candidate may see the work already done or being done; he then sends in his application, giving an account of his previous career and the names of referees, together with the title of the subject he proposes to select for his research work. The fellowships are divided into the following categories: Junior (three years), £400 per annum; fourth year, £500 per annum; senior (three years), £700 per annum, thus providing for seven years of continuous research. In 1927 a senior fellowship to the value of £1,000 per annum for five years was created for research into tropical medicine, and the first holder is Dr. Edward Hindle, whose subject is yellow fever. The total number of Fellows elected, up to and including 1930, is 138, and women are included in that number. Records have been kept of the subsequent career of holders of the Beit Fellowships, and it is interesting to read that four men have received the Fellowship of the Royal Society (the greatest distinction in science) and sixteen have been appointed to university professorships. Most of the others occupy whole-time positions for teaching, research or scientific work; a few have taken up medical practice, but even so devote a certain amount of their time to scientific research work. Though some of the women have married, all of them continued for many years the research work for which they held their fellowship and occupy or have occupied such posts as university lecturers, pathologists, bacteriologists, physicians to children's hospitals *et cetera*. Two of the most famous names in medicine appear among the roll of Beit Fellows—Sir Thomas Lewis, F.R.S., the specialist in disorders of the heart, and Professor Edward Mellanby, F.R.S., who has devoted himself to the study of rickets.

As the Trust has no buildings of its own, the Fellows are given hospitality in various laboratories, not only in this country, but on the Continent and in America. It may be noted that among the eight holders of Junior Fellowships appointed this year there are two graduates of the University of Melbourne.

## Correspondence.

### THE NEW SOUTH WALES BRANCH OF THE BRITISH MEDICAL ASSOCIATION.

SIR: It may be of interest to members of the Association to know of the earliest records concerning the origin of the New South Wales Branch, as given in *The British Medical Journal* of July 17, 1880, page 108.

Proceedings of the Committee of Council held at the offices of the Association, 161A, Strand, on Wednesday, July 7th, 1880, Dr. Alfred Carpenter (President of the Council) in the chair . . .

Read letter from Dr. Milford of Sydney, relative to the formation of a branch in that colony.

Resolved: That the Sydney and New South Wales Branch be and it is hereby recognized as a Branch of the British Medical Association.

Resolved: That the Committee of Council desire to offer their warm welcome to the Australian Branches formed at Adelaide and Sydney, now formally recognized, and trust that the new Branches may not only be the means of cementing the good feeling which already exists between the members of the medical profession in England and her colonies, but may also facilitate the interchange of ideas, and so prove of value in the advancement of medical science and the interests of the profession.

The next reference in *The British Medical Journal* to the New South Wales Branch is in the first volume of 1881, March 12, page 497. From the name it will be noted that the words "Sydney and" are omitted.

#### New South Wales Branch: General Meeting.

The last general meeting of the session of 1880 took place at the board room of the Sydney Infirmary on December 13th, 1880. There were present the President, Dr. Renwick, M.P., in the chair; Dr. Moffitt, Vice-President; and fourteen other members . . .

*Recognition of the Branch.*—A letter from Mr. Fowke, dated September 14th, 1880, in which was contained a courteous communication from the Council of the British Medical Association, announcing the recognition of the Branch, was read; and the Secretary was directed to acknowledge it.

Francis Fowke was the General Secretary of the British Medical Association.

Yours, etc.,

T. STORIE DIXON.

Macquarie Street, Sydney.  
September 25, 1930.

### THE ZUND-BURGUET TREATMENT OF DEAFNESS.

SIR: Dr. G. C. Cathcart in *The Lancet*, May 9, 1925, page 986, introduced to the profession in England his experience in alleviating chronic progressive deafness by the electrophonoid reeducation of Zund-Burguet. He claimed 60% cases improved. Since that time there have been several other workers in England, but little has been published in support or refutation of the claims.

I had the privilege of seeing the instrument in use in the hands of Drs. Cathcart and Scott Stevenson, of London, and receiving personal instruction from the inventor at Paris. My observation of their cases had not entirely convinced me that it would produce any extraordinary results, but I was of the opinion that a sufficiently large number of patients showed such improvement as justified my making an extensive trial of the method in my own practice. Deafness is well known to be so constantly progressive and resistant to treatment that no method capable of producing a halt or any degree of improvement can be discarded without the most extensive investigation. Dr. Bettington's experience detailed in *THE MEDICAL JOURNAL OF AUSTRALIA* of September 13 is interesting.

Four years ago I brought a Zund-Burguet instrument to Sydney and have treated approximately seventy patients with it. I must confess that my enthusiasm for the method has diminished somewhat with the time that has passed. At first I kept detailed records of forty-three cases, and for the most part they were disappointing. Eight cases showed some improvement, all of them temporary as regards hearing. Three or four others who were troubled with tinnitus claimed that the symptom was improved or alleviated.

In my series there were no striking results. I found, and still find, it impossible to forecast success. Holding this view, I refrain from urging patients to submit to treatment, and only agree to carry it out with the clearest understanding of the position. To be of use treatments must be frequent and over a long period of time. Consequently patients who live at any distance are excluded.

My present opinion is that tinnitus is often relieved to some extent and in some cases the patients themselves or their relatives claim that the deafness is improved. Few patients show an improvement which is measurable objectively by ordinary methods. Two patients claimed that their appreciation of musical sounds had been restored after being disturbed by an attack of otitis. This was stated voluntarily by the patients and corresponds with Dr. Cathcart's experience in several instances.

Yours, etc.,

E. P. BLASHKI.

193, Macquarie Street,  
Sydney.

### OTITIS MEDIA.

SIR: I cannot accept the excuse offered by Dr. G. A. D. McArthur for the omission by Dr. Godsall of all reference to the after-care of the operations performed for the above condition. The opening sentence in the article by the author reads as follows: "The importance of early diagnosis and correct treatment in acute otitis media cannot be over-estimated." If by correct treatment only operative is meant, we must take it for granted that the after-care is mere routine. I contend that it is not and therefore should have had a place which its importance demands. There is no mention in the article of the evils of mixed infection and Dr. McArthur tells us that it is seen only in a small minority of cases. To what, then, is due all the running ears and chronic antrums met with daily? I am misunderstood if I am read to mean anything that would withdraw attention from chronic infection of the mastoid. My aim is to prevent mixed infection and although I have read in text books that this should be done, I have never found anyone to suggest how. As stated in my letter, this omission is common to all suppurative conditions from pure or specific strains dealt with in books or journals. I will be glad if anyone, especially Dr. McArthur, can give a reference in which this detailed instruction may be found in such a form that it may be efficiently carried out by students or practitioners. I give the whole range of surgery, general and special, for the search. It sounds easy.

Yours, etc.,

A. C. F. HALFORD.

"Wickham House,"  
Brisbane.

September 27, 1930.

### COTTAGE HOSPITALS IN NORTH AMERICA.

SIR: In Alberta if a little town wants to have a cottage hospital they notify the Minister of Health. He then orders a referendum to be taken of the people in the town and for a certain radius around. If two-thirds of the people vote in favour, the Government finds the money to erect the hospital, but rates the people so that the interest and cost of construction is paid. They are further rated for maintenance and if they or members of their families

require hospital attention, they are taken in at 28s. per week. People who are not ratepayers can pay the same subscription as the ratepayer and obtain similar advantages. People who do not come under these two categories pay full nursing rates.

They told me that so far the rates had never been raised as they have been in New Zealand, and that it is working smoothly. I noticed one proviso which I did not like: that no medical practitioner may be a member of the board of management, whereas, as you know, our bush nursing principle is that they must be.

I think our system will probably work better in the long run, because one never knows what a new minister may do.

So far as I am aware this is the only place in the North American Continent where there is anything like our Victorian Bush Nursing Association system.

Yours, etc.,

J. W. BARRETT.

105, Collins Street,  
Melbourne.

October 14, 1930.

#### EXAMINATION OF INEBRIATES.

SIR: In the examination of persons alleged to be suffering from alcoholism, it is worth while reminding practitioners of one point which should never be neglected, that is, to ask the patient to sign his name and write his address. Several such signatures should be obtained, and they form a lasting record of the condition of the patient at the time. They can later be compared with the signature of the person concerned as used for banking or other purposes.

Yours, etc.,

CLIFFORD HENRY, M.B., Ch.M., D.P.

Sydney.

October 13, 1930.

### Public Health.

#### LECTURES IN SYDNEY.

In connexion with Part II of the course for the Diploma of Public Health of the University of Sydney, a special set of lectures is being given for members of the medical profession. The lectures are delivered in the lecture theatre of the new School of Public Health and Tropical Medicine. All medical graduates will be welcome. Lectures will be delivered as follows:

Monday, November 3, at 2 p.m.: An excursion for the investigation of methods of industrial hygiene, Dr. C. Badham.

Tuesday, November 4, 2 to 3 p.m.: "Occupational Statistics and Tuberculosis," Professor Harvey Sutton; 3 to 4 p.m.: "Beri Beri," Dr. A. H. Baldwin; 4.10 to 5.30 p.m.: "Industrial Poisoning," Dr. Keith Moore.

Wednesday, November 5, 2 to 3 p.m.: "Length of Life and Mortalities," Professor Harvey Sutton; 3 to 4 p.m.: "Epidemiology," Dr. A. H. Baldwin; 4.10 to 5.30 p.m.: "Industrial Welfare," Dr. Keith Moore.

Thursday, November 6, 2 to 3 p.m.: "Vital Statistics," Dr. A. H. Baldwin; 3 to 4 p.m.: "Epidemiology, Respiratory Diseases," Dr. W. C. Sawers; 4.10 to 5.30 p.m.: "Accident Prevention," Dr. Keith Moore.

Friday, November 7, 3 p.m.: An excursion for the investigation of the methods of industrial hygiene, Dr. C. Badham.

### Obituary.

#### HERBERT WILLIAM CARSON.

By the death of Mr. Herbert William Carson on August 31, 1930, the world of surgery has suffered an untimely loss and this journal a friend. For several years he acted

as our London Correspondent. His letters were written on subjects which had a wide appeal, and he always handled his theme in an interesting way; one of his letters is published in this issue.

Herbert William Carson studied medicine at Saint Bartholomew's Hospital, London, in company with Henry William Armit, until recently Editor of THE MEDICAL JOURNAL OF AUSTRALIA. He became a Fellow of the Royal College of Surgeons of England in 1899 and chose to practise as a general surgeon. At the time of his death he was Senior Surgeon of the Prince of Wales's General Hospital, London. Australians and practitioners in the other overseas Dominions are in his debt on account of his association with the Fellowship of Medicine; he was Chairman of its Executive Committee. This organization, as is well known, is of the utmost use to medical practitioners visiting London in search of post-graduate training. Not long before his death he became a member of the provisional organization committee for the new Post-Graduate Hospital and Medical School at Hammersmith, London. He also rendered signal service to the British Medical Association. Had he lived, he would have visited the recent annual meeting of the British Medical Association at Winnipeg, Canada, as Vice-President of the Section of Surgery. His contributions to medical literature were numerous; perhaps the best known is his "Modern Operative Surgery." His place will not be easily filled.

### Proceedings of the Australian Medical Boards.

#### VICTORIA.

THE undermentioned have been registered under the provisions of Part I of the Medical Act 1928, of Victoria, as duly qualified medical practitioners:

Officer (née Veale), Doris Lyne, M.B., B.S., 1921 (London), M.R.C.S., 1921 (England), L.R.C.P., 1921 (London), c.o. Dalgety and Company, Bourke Street, Melbourne, C.I.  
Benjamin, Philip Joseph, M.B., B.S., 1930 (Univ. Melbourne), 100, Martin Street, Elsternwick, S.4.  
Biggins, Richard Maxwell, M.B., B.S., 1930 (Univ. Melbourne), Newstead, Launceston, Tasmania.  
Blaubaum, Rex Vivian, M.B., B.S., 1930 (Univ. Melbourne), 11, Denbigh Road, Armadale, S.E.3.  
Bray, Simon Redvers, M.B., B.S., 1930 (Univ. Melbourne), "St. Anstell," St. Arnaud.  
Cussen, Kevin Richard, M.B., B.S., 1930 (Univ. Melbourne), 1, Auburn Road, Auburn, E.2.  
Davis, Morris Cael, M.B., B.S., 1930 (Univ. Melbourne), 278, Amess Street, North Carlton, N.4.  
Deans, Berwyn Lincoln, M.B., B.S., 1930 (Univ. Melbourne), 339, High Street, East Malvern, S.E.6.  
Dungan, Rae William, M.B., B.S., 1930 (Univ. Melbourne), 18, King Street, Elsternwick, S.4.  
Gowland, John Hudson, M.B., B.S., 1930 (Univ. Melbourne), 252, Bell Street, Coburg, N.13.  
Guinane, Francis Robert, M.B., B.S., 1930 (Univ. Melbourne), General Hospital, Brisbane.  
Hagger, Thomas Dudley, M.B., B.S., 1930 (Univ. Melbourne), Queen's College, Carlton, N.3.  
Horan, John Patrick, M.B., B.S., 1930 (Univ. Melbourne), Newman College, Carlton, N.3.  
Hughes, Montagu Owen Kent, M.B., B.S., 1930 (Univ. Melbourne), 22, Collins Street, Melbourne, C.I.  
Lewis, Ronald Awstun, M.B., B.S., 1930 (Univ. Melbourne), 26, Princess Street, Seddon, W.11.  
Long, William John, M.B., B.S., 1930 (Univ. Melbourne), 7, Kensington Road, South Yarra, S.E.1.  
Marsden, Charles Moustaka, M.B., B.S., 1930 (Univ. Melbourne), 27, Chapel Street, East St. Kilda, S.2.  
Maynard, Roy Bryant, M.B., B.S., 1930 (Univ. Melbourne), 8, Russell Street, North Williamstown, W.16.  
Macdonald, Allan Michael, M.B., B.S., 1930 (Univ. Melbourne), 5, Merribell Grove, Coburg, M.3.

McComas, Edith Elizabeth, M.B., B.S., 1930 (Univ. Melbourne), 29, Mary Street, Hawthorn, E.2.  
 McDonald, Edward Allen Fancourt, M.B., B.S., 1930 (Univ. Melbourne), Trinity College, Carlton, N.3.  
 McKillop, William John, M.B., B.S., 1930 (Univ. Melbourne), Dederang.  
 Orton, Robert Hamilton, M.B., B.S., 1930 (Univ. Melbourne), 68, Paisley Street, South Yarra, S.E.1.  
 Raphael, Cecil Neville, M.B., B.S., 1930 (Univ. Melbourne), 155, Victoria Parade, Fitzroy, N.6.  
 Robinson, Mary Hallam, M.B., B.S., 1930 (Univ. Melbourne), Pakington Street, Geelong.  
 Ross, Colin Wallace, M.B., B.S., 1930 (Univ. Melbourne), 23, Eskdale Road, Caulfield, S.E.7.  
 Rowlands, Eustace Alwynne, M.B., B.S., 1930 (Univ. Melbourne), 17, Queen's Road, Melbourne, S.C.2.  
 Sewell, James Erskine, M.B., B.S., 1930 (Univ. Melbourne), 31, Yuille Street, Brighton Beach, S.5.  
 Stewart, James Cuming, M.B., B.S., 1930 (Univ. Melbourne), 18, Sorrett Avenue, Malvern, S.E.4.  
 Swinburne, Truman George, M.B., B.S., 1930 (Univ. Melbourne), Melbourne Hospital, C.1.  
 Tisdall, Henry Thomas, M.B., B.S., 1930 (Univ. Melbourne), Cohuna.  
 Travers, Lennard Gilmour, M.B., B.S., 1930 (Univ. Melbourne), Garden Court, Marne Street, South Yarra, S.E.1.  
 Weir, Stewart Irvine, M.B., B.S., 1930 (Univ. Melbourne), Terang.  
 Zeigler, Joseph Francis, M.B., B.S., 1930 (Univ. Melbourne), 20, Rowe Street, North Fitzroy, N.7.

#### Additional diplomas registered:

Schafer, David Paul Hannaford, M.B., B.S., 1930 (Melbourne).  
 Schafer, Noel Theodore Hannaford, M.B., B.S., 1930 (Melbourne).  
 Allen, Thomas Gilmour Bowen, M.D., 1930 (Melbourne).  
 Box, Noel Edward Hamilton, F.R.C.S., 1928 (Edinburgh), Dip.L.O., 1928 (England).  
 Troup, Gilbert Reynolds, M.R.C.P., 1930 (London).

### Diary for the Month.

- Nov. 4.—New South Wales Branch, B.M.A.: Organization and Science Committee.  
 Nov. 4.—New South Wales Branch, B.M.A.: Post-Graduate Work Committee.  
 Nov. 4.—New South Wales Branch, B.M.A.: Hospitals Committee.  
 Nov. 6.—South Australian Branch, B.M.A.: Council.  
 Nov. 7.—Queensland Branch, B.M.A.: Branch.  
 Nov. 11.—New South Wales Branch, B.M.A.: Ethics Committee.  
 Nov. 12.—Victorian Branch, B.M.A.: Branch.  
 Nov. 13.—New South Wales Branch, B.M.A.: Clinical Meeting.  
 Nov. 13.—Victorian Branch, B.M.A.: Council.  
 Nov. 14.—Queensland Branch, B.M.A.: Council.  
 Nov. 18.—New South Wales Branch, B.M.A.: Executive and Finance Committee.  
 Nov. 25.—New South Wales Branch, B.M.A.: Medical Politics Committee.  
 Nov. 26.—Victorian Branch, B.M.A.: Council.  
 Nov. 27.—New South Wales Branch, B.M.A.: Branch.  
 Nov. 27.—South Australian Branch, B.M.A.: Branch.  
 Nov. 28.—Queensland Branch, B.M.A.: Council.  
 Dec. 2.—New South Wales Branch, B.M.A.: Organization and Science Committee.  
 Dec. 2.—New South Wales Branch, B.M.A.: Post-Graduate Work Committee.  
 Dec. 2.—New South Wales Branch, B.M.A.: Hospitals Committee.  
 Dec. 3.—Victorian Branch, B.M.A.: Annual General Meeting.  
 Dec. 4.—South Australian Branch, B.M.A.: Council.

### Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, locum tenentes sought, etc., see "Advertiser," page xvi.

CHILDREN'S HOSPITAL, INCORPORATED. PERTH. WESTERN AUSTRALIA: Junior Resident Medical Officers.

MACKAY HOSPITALS BOARD, QUEENSLAND: Resident Medical Officer.

### Medical Appointments: Important Notice.

MEDICAL practitioners are requested not to apply for any appointment referred to in the following table, without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

BRANCH.	APPOINTMENTS.
NEW SOUTH WALES: Honorary Secretary, 135, Macquarie Street, Sydney.	Australian Natives' Association. Ashfield and District United Friendly Societies' Dispensary. Balmalm United Friendly Societies' Dispensary. Friendly Society Lodges at Casino. Leichhardt and Petersham United Friendly Societies' Dispensary. Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney. North Sydney Friendly Societies' Dispensary Limited. People's Prudential Assurance Company, Limited. Phoenix Mutual Provident Society.
VICTORIAN: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries. Australian Prudential Association Proprietary, Limited. Mutual National Provident Club. National Provident Association. Hospital or other appointments outside Victoria.
QUEENSLAND: Honorary Secretary, B.M.A. Building, Adelaide Street, Brisbane.	Members desiring to accept appointment in ANY COUNTRY HOSPITAL, are advised to submit a copy of their agreement to the Council before signing, in their own interests. Brisbane Associated Friendly Societies' Medical Institute. Mount Isa Hospital. Mount Isa Mines.
SOUTH AUSTRALIAN: Secretary, 207, North Terrace, Adelaide.	All Lodge Appointments in South Australia. All Contract Practice Appointments in South Australia.
WESTERN AUSTRALIAN: Honorary Secretary, 65, Saint George's Terrace, Perth.	All Contract Practice Appointments in Western Australia.
NEW ZEALAND (Wellington Division): Honorary Secretary, Wellington.	Friendly Society Lodges, Wellington, New Zealand.

### Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

All communications should be addressed to "The Editor," THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales. (Telephones: MW 2651-2.)

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